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NOVEMBER 1981

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS

Logger's efficien[illegible] pays off in three-side skyline show[illegible]

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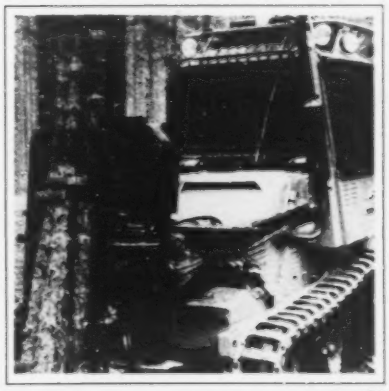

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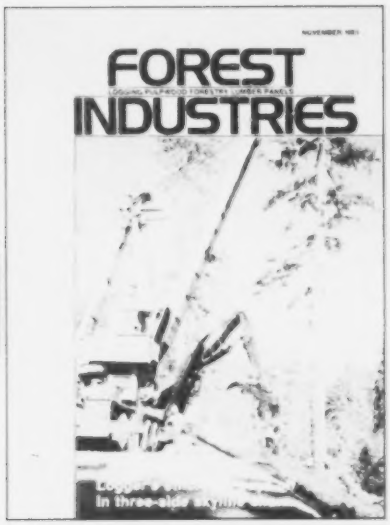

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A hard look at Redwood Park—for once, leaving out emotion

Emotional claims win votes. Realities often demolish claims, but too late. Setting up Redwood National Park has cost almost $1 billion, and not all bills are paid

By HERB LAMBERT
Editor

SAN FRANCISCO, CALIF.—Budget overruns in government construction and defense contracts generate flak—when the people find out about them. Federal budget cuts in certain areas also generate flak—when exposed.

Taxpayers are irate. Congressmen, depending on which side of the aisle they sit or which political philosophy they espouse, express horror. They call for investigations. But since Congress holds the purse strings, Congressmen must look in the mirror.

Some legislators, perhaps many, who voted for the Redwood National Park (and later, its expansion) no longer serve in Washington. Others still occupy their old—or perhaps new—desks. It should be worth a few minutes of their time, and the time of some reporters, editors and cost-conscious as well as cost-flouting environmentalists, to scan a recent White Paper memorandum on the park. The memorandum compares original claims with current realities.

The White Paper, based on data compiled by Arcata Corp., Menlo Park, Calif., is divided into two fundamental parts: creation of the park in 1968 and its expansion 10 years later. The analysis, for that is precisely what it is, focuses on three issues:

- Estimates of the amount of just compensation that the federal government would be required to pay to owners for private land taken for the park;
- Forecasts of the number of jobs lost in the timber industry and the implications of those losses to local, state and federal governments; and
- Assumptions regarding the extent to which tourism would increase as a result of creating and expanding the park, and the associated jobs created as

Creation of the Redwood National Park, 1968
The claims and the realities

Issue	Environmentalists	Government	Landowners	Others	The realities
Timberland acquisition costs	72,000-acre park for $100 million.	30,000-acre park for $92 million	30,000-acre park for two to three times greater than $92 million.		30,000-acre park for $306,016,344 with timberland acquisition costs alone of $205 million.
Job losses	None. Tourism and increased harvest on Six Rivers would offset the losses.	Probable net gain due to increased tourism, land exchange and increased harvesting on Six Rivers.	Loss will exceed 2,000 unless Six Rivers allowable cut is greatly increased; tourism will not create significant employment.	Arthur D. Little forecast that 498 jobs lost would be offset by increase in tourism.	718 direct jobs lost; 1,300 regional jobs lost; 2,039 total jobs lost; 15% unemployment rate.
Tourism	Endorsed Arthur D. Little report, "There will be such an outpouring of visitors that tourism rather than timber will become the dominant industry."	950,000 visitor days to a new redwood park by 1973.	Cold and damp climate and great distance from metropolitan centers will combine to limit tourist growth.	Arthur D. Little forecast 250,000 added visitor days by 1973; 1,600,000 added visitor days by 1973.	35,500 visitor days in 1975: • 5% of A. D. Little estimate. • 4% of government estimate.

offsets to lost timber jobs.

Data on these three issues are summarized in the accompanying charts.

The 21-page memorandum covers each item in considerable detail, using records of hearings, testimony and statements by experts and disinterested people. It traces much of the financial activity required, some of which is still taking place.

This narrative explanation of the summaries in the charts offers more information.

For example, the Redwood National Park ranks 29th of 43 U.S. national parks in visitors. It is, without question, by far the costliest park ever created.

As has been stated in past years in FOREST INDUSTRIES, and as people familiar with redwoods know, a national park was not necessary "to save the last redwoods." Park proponents often used that claim in their campaign.

A major subject in the long controversy, particularly in the later expansion phase, was the "Tall Trees" grove. They grew on private land, but are now within the park. While visitors to these specimens have been relatively few in number, officials apparently are considering limiting access to the grove: 2,000 visitors per summer is too many. The people visiting may adversely affect the spectacular redwoods.

Neither side in the controversy had a crystal ball, and no prognosticator is perfect. Still, it is interesting to note that the assorted claims by park proponents—back then and since then—have proven to be far off target.

Such claims, many linked with emotional appeals, swayed votes. Excerpts from these claims, originally voiced at various hearings, are especially interesting in light of today's facts.

This commentary on the White Paper should not be taken to imply there should never have been a Redwood National Park. In the writer's opinion, the park should exist. Its proper size, of course, is debatable. But before the park was created, there was already reservation (preservation, if you prefer) of prime redwood groves in California's state parks. True, the Tall Trees grove was not in public ownership. Arrangement for buying those trees, or for some special access to them, might well have been considered.

The Redwood National Park exists. Further contemplation is moot.

However, a park as big and costly as this one was not needed. That cost is now not far below $1 billion and the books have not yet been closed on the transaction. And they surely have not been closed on the park's financial fallout in the redwood region.

Congressmen and others who are sensitive to costly outlays and budget cuts would do well to familiarize themselves with what was wrought in the case of the Redwood National Park. They should especially note the various claims that were voiced about the need for the park and the results or circumstances its creation would generate—but did not.

More importantly, attention should be paid to the probable final cost in dollars versus the claimed benefits and results. Such comparison would unquestionably suggest the importance of a cost-benefit analysis in natural resource decisions. ■

Redwoods. They offer both magic and controversy, fact and fiction. Few, if any, species are as emotional a subject, as durable a product.

Expansion of the Redwood National Park, 1978

The claims and the realities

Issue	Environmentalists	Government	Landowners	Others	The realities
Timberland acquisition costs	77,000-acre park for $130 million; or 48,000-acre park for $237 million.	48,000-acre park for $359 million.	48,000-acre park for $600 million to $750 million.	48,000-acre park for: • Over $450 million. • Over $500 million. • Total cost of $1.1 billion for park.	$600 million to $1 billion.
Job losses	Minimum and inevitable; in any case, increased tourism would soften adverse impact.	611 direct jobs, 1,368 in total offset by 820 high-probability new jobs; cost of $40 million to taxpayers for displaced workers.	1,220 direct job losses; 2,700 regional jobs lost.	Over next 20 years, job income of $520 million and regional tax loss of $192 million; an expansion rate of this scale would result in unemployment rate of 19%.	870 direct jobs lost and 2,500 regional jobs lost; more than 2,500 persons have been receiving benefits under Title II of the Act creating the park; best current estimate of costs for displaced workers is $70 million.
Tourism	Expect great influx of tourists.	"Tourism is going to be a growth industry for that area, particularly with expansion of the park."	Park expansion will not boost tourism; adding acres will not increase the number of tourists.	You cannot change climate or geography; people like to go where the climate is hospitable.	Visitor days are still under 40,000; attendance has grown 1% since the expansion three years ago.

Larger, mechanized loggers score highest productivity

Survey of Minnesota operators shows tree-length logging with mechanical felling, grapple skidding and chain saw delimbing is most productive combination

By KIP BOLSTAD
and STEVEN A. SINCLAIR

ST. PAUL, MINN.—Rapidly-increasing costs of equipment and labor experienced in today's timber harvesting industry place productivity high among the concerns of the logging manager. Increasing productivity of the logging operation can mean the difference between profit and bankruptcy. Productivity improvements resulting from mechanization and tree-length harvesting have been documented in a recent study of Minnesota loggers[1]. Survey data may prove helpful in making a comparison with individual operations.

Production information obtained from 141 logging operations showed individual company productivity ranged from 0.059 cord per man-hour to 2.261 cords per man-hour.

The most productive mixture of harvesting equipment was used by three firms to produce tree-length material by mechanical felling, chain saw delimbing and grapple skidding. These operations had a mean production rate of 1.390 cords per man-hour.

The most productive felling/skidding combination of equipment was used by 27 firms and consisted of mechanical felling and rubber-tired grapple skidders. This combination resulted in a mean production rate of 0.952 cord per man-hour.

The survey group was broken down into size and skidding method classifications, with the averages obtained as follows:

- Production under 1,000 cords per year, 49 companies averaging 0.336 cord per man-hour.
- Production over 1,000 cords per year, 92 companies averaging 0.748 cord per man-hour.
- Firms skidding tree length, 58 averaging 0.757 cord per man-hour.
- Firms skidding full trees, 32 averaging 0.751 cord per man-hour.
- Firms forwarding shortwood, two averaging 0.425 cord per man-hour.

Compare these figures with those

TABLE 1—Summary of productivity by annual production volume for all firms

Annual volume (cords)	Mean Productivity	Standard deviation	Median productivity	Range	Number of firms	Significance*
	Cords per man-hour					
Group 1: Less than 1,000	.336	.301	.243	.059-1.418	49	
Group 2: Greater than 1,000	.748	.418	.655	.081-2.261	92	
1,000	.336	.301	.243	.059-1.418	49	A
1,000-1,999	.533	.401	.425	.081-1.739	17	B
2,000-2,999	.563	.280	.515	.250-1.140	18	B
3,000-3,999	.628	.198	.632	.292-1.057	15	B
4,000-4,999	.897	.464	.697	.260-1.722	12	C
5,000	.980	.439	.953	.320-2.261	30	C
All firms	.604	.428	.500	.059-2.261	141	

TABLE 2—Duncan's Multiple Range Test for mean production per man-hour
(Firms over 1,000 cords annual production)

Combination		Mean production per man-hour, cords	Standard deviation	Number of firms	Significance
Felling	Skidding				
Mechanical	Rubber-tired cable	.567	.312	12	A
Chainsaw	Rubber-tired cable	.690	.382	52	A
Mechanical	Rubber-tired grapple	.952	.454	27	B
Entire population		.751	.419	91	

*Means with the same letter are not significantly different at the .10 level according to Duncan's Multiple Range test.

TABLE 3—Mean production per man-hour for 10 types of harvesting equipment combinations
(Firms over 1,000 cords annual production)

Type of equipment				Mean production per man-hour, cords	Standard deviation	Number of firms
Fell	Skid	Limb	Buck			
Chainsaw	Cable	Chainsaw	Treelength (not bucked)	.465	.197	3
Mechanical	Cable	Chainsaw	Chainsaw	.581	.345	7
Chainsaw	Cable	Chainsaw	Chainsaw	.677	.382	37
Chainsaw	Cable	Chainsaw	Slasher	.688	.347	6
Mechanical	Grapple	Chainsaw	Chainsaw	.695	.155	5
Mechanical	Grapple	—Processor—		.698	.429	5
Mechanical	Cable	Chainsaw	Treelength (not bucked)	.733	.213	3
Chainsaw	Cable	—Processor—		.770	.337	3
Mechanical	Grapple	Chainsaw	Slasher	.875	.317	9
Mechanical	Grapple	Chainsaw	Treelength (not bucked)	1.390	.309	3
Entire Population				.718		81

produced by some earlier surveys. In 1944 the productivity of southern pulpwood labor was only two cords per man-day[2]. In 1966 the productivity of 12 company logging operations in the South ranged from 2.16 to 6.99 cords per man-day with a mean production rate of 3.72 cords per man-day[3]. In 1971 the productivity of 26 northeastern logging firms ranged from 2.6 to 10.3 cords per man-day with a mean production rate of 4.72 cords per man-day[4].

As noted, usable information was secured from 141 logging firms. These were divided into two groups, based on total production volume registered in 1979.

Group 1: under 1,000 cords

The 49 firms in this category produced annual volumes ranging from 31 to 950 cords with a mean volume of 415 cords per firm and a median volume of 300 cords per firm. The majority of these companies used chain saws and rubber-tired cable skidders.

Only eight firms in Group 1 produced strictly one roundwood product, with the remaining companies producing two, three or four different products. Production rates for all 49 firms averaged 0.336 cord per man-hour and ranged from 0.059 to 1.418 cords per man-hour. The median production rate was 0.243 cord per man-hour.

Of these companies, 37 reported they skidded tree length and produced primarily shortwood products. Production rates for these firms averaged 0.345 cord per man-hour. Three firms which skidded tree length and produced tree-length products averaged 0.833 cord per man-hour in comparison to eight shortwood operations which averaged 0.175 cord per man-hour. One firm skidded full trees and produced primarily shortwood products.

Group 2: over 1,000 cords

The 92 firms in Group 2 produced annual volumes ranging from 1,021 cords to 24,320 cords with a mean volume of 4,864 cords per firm and a median volume of 3,566 cords per firm annually. Although the majority of these companies still relied heavily on the chain saw and rubber-tired cable skidder, there were several fully-mechanized operations using equipment such as feller-bunchers, grapple skidders and roadside processors.

The group included 58 firms which skidded tree length, 51 of which produced primarily shortwood products and seven of which produced tree-length products. There were 32 firms which skidded full-tree, 26 producing shortwood products and five producing tree-length products. One firm produced strictly whole-tree chips. Only two firms skidded (or forwarded) shortwood.

Only 10 firms in Group 2 produced strictly one roundwood product, while the remaining firms reported producing between two and seven different products. Production rates for all 92 firms averaged 0.748 cord per man-hour. The median was 0.655 cord per man-hour.

Table 1 gives a summary of mean productivity for all 141 firms broken down by annual volume.

Table 2 shows the results of an analysis of mean productivity for Group 2 firms placed into three felling/skidding combinations. All except one firm, which used a forwarder, were placed into one of these three groups based on the equipment used in felling and skidding operations.

A Duncan's Multiple Range test was run for these firms and, as Table 2 shows, the firms that reported using mechanical felling and rubber-tired grapple skidders had significantly higher productivity than did firms using mechanical or chain saw felling and rubber-tired cable skidders.

The results of a ranking of productivity by type of equipment mix for firms in Group 2 are presented in Table 3. This ranking considers only 10 equipment mixes and does not completely consider sequence of operations or form of product skidded. ■

THE AUTHORS are, respectively, Graduate Research Assistant and Assistant Professor, Department of Forest Products, University of Minnesota, St. Paul, Minn.

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Portable bridge replaced rotting log stringer span on forest road on Warm Springs Indian Reservation in Oregon

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Family members work together on mechanized shortwood logging jobs
R.L. Womack of Sikes, La., his sons and cousins harvest pulpwood with a feller-buncher, skidder and landing machine that loads, bucks and delimbs stems

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Rebuilt mill cuts more lumber with a smaller crew
Westvaco Lumber's Summerville, S.C., mill was rebuilt with three goals: higher production, improved recovery, lower labor costs. It met its goals

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Bad times likely to stay a while for U.S. housing
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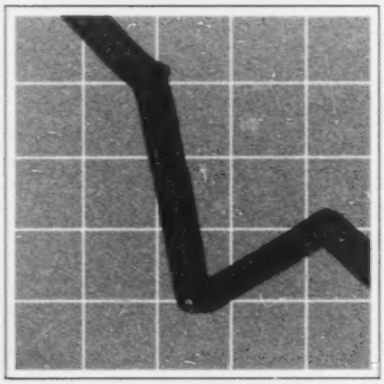

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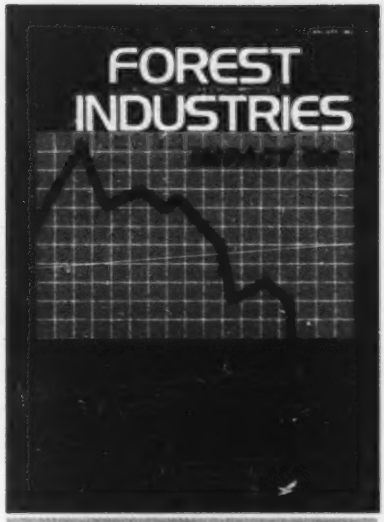

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Drying sawdust to fire brick kiln saves fuel and improves product

Georgia-Merry Companies Inc., Augusta, Ga., has installed a woodwaste processing system to supply fuel to tunnel kilns

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First U.S. large-scale biomass gasification unit soon to be on line

A California State office building will be heated and cooled by an Energy Products of Idaho system that converts biomass to low-Btu combustible gas

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Offshore markets bring relief to a profit-starved industry

Rising world demand for wood, notably in Europe and the Pacific Rim, makes the export market an inviting target for expansion. U.S. exports could double by 2000

By MARY LOU CORLETT
Managing Editor

PORTLAND, ORE.—Faced with a crippled housing industry and a recession that shows no signs of ending soon, many U.S. forest products companies are relying on the export market as a means of cushioning financial blows.

Since 1979, profits for U.S. forest products companies have dropped nearly 75%, so it's not surprising to see heightened interest in exports. Traditionally, U.S. producers have entered the export market when the domestic market is down and then have pulled out when the U.S. market is up.

It appears that in the current downturn, however, industry is becoming more committed to the export market, viewing it as a complement to, not a replacement for, domestic sales. Companies and associations are scrambling to establish overseas offices and organize market development programs because they anticipate long-term—and substantial—payoffs.

Already some companies are seeing those payoffs. Crown Zellerbach, for example, created an international marketing division two years ago, establishing offices in Tokyo, Brussels, London and Mexico City and finding agents in several other cities. The division is growing 20% annually, a figure nearly 10 times that of CZ as a whole.

The export market's appeal lies in the fact that world demand for wood products is rising rapidly. Although some overseas markets aren't as healthy as they were a year or two ago—due primarily to Japan's own housing slump and Europe's recession—analysts expect renewed vigor sometime this year. The United Nations Food and Agricultural Organization (FAO) has projected that world wood markets will double between 1975 and 2000.

The United States, currently a net importer of wood, has an export market share of about 18%. Last year it shipped $3.6 billion worth of wood overseas. Nonetheless, it comes in a poor second to Canada, which produces nearly a third of the wood imported by the rest of the world. About 30% of that volume is shipped to the U.S.

Other major wood producers are the U.S.S.R., Sweden, Malaysia, Finland and Indonesia. (See Table 1 for a breakdown of softwood lumber exports.)

How to improve share of market—and thus boost profits—was one of the main topics at an wood exports workshop held here Dec. 3-4, sponsored by FOREST INDUSTRIES in cooperation with the National Forest Products Assn., American Plywood Assn. and Western Wood Products Assn.

John Ward, NFPA's director of international trade, noted that the U.S. enjoys an excellent long-term competitive position.

"We have the third largest inventory of wood fiber in the world (behind the U.S.S.R. and Canada), and our forest productivity exceeds that of either Canada or the U.S.S.R.," Ward said. The United States will increase its competitiveness in the world market, he predicted, because the Soviet Union soon will be forced to turn to Siberia for timber, Soviet and Canadian costs will increase as they go into less accessible areas for wood, and Scandinavia—the chief supplier to Europe—is approaching the limits of sustainable production. Consequently, Ward sees a steady increase in the volume of U.S. wood exports (see Fig. 1).

Where the markets are

Workshop speakers identified key export markets, detailing problems and potential in each area.

Table 1—Softwood lumber shipments, 1979
(Million board feet)

Major markets	Total imports	Major supplying regions				
		Canada	U.S.	Scandinavia	U.S.S.R.	Other
United States	11,118	10,780	—	—	—	338
Japan	2,011	1,015	833	—	57	306
United Kingdom	3,271	700	39	1,488	532	512
Western Europe	7,061	422	300	3,225	966	2,349
North Africa/Middle East	1,453	117	45	578	195	518
Australia	394	138	93	—	—	63
Other markets		91	523	636	1,485	
Total exports		13,281	1,733	5,927	3,234	

Source: Statistics Canada, Ottawa, Ont.

Japan: By far, Japan is the number-one market. Despite its housing crisis, the country needs great quantities of wood. Last year the U.S. sent $1.9 billion worth of wood to Japan (although two-thirds of that volume was logs).

"We think that over the next 10 years the Japanese market could increase by 50%, or another $1 billion," Ward said. He predicts the volume of raw logs will be halved, and lumber, chips, plywood and particleboard shipments will increase substantially. A "small but growing" trend toward building homes "the American way" (2x4 construction), he said, will boost export sales.

American plywood, however, is still faring badly in Japan. William Robison, APA vice president of marketing, told workshop registrants the Japanese market is "tantalizing, but virtually untapped." American manufacturers have been trying to break into that market since 1964 and have met "formidable obstacles," he said. Among the most serious:

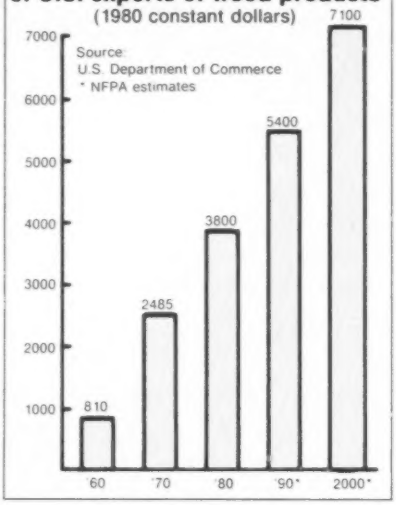
- American plywood isn't accepted by Japanese plywood standards.
- There is a prohibitive tariff on softwood plywood going into Japan.

Robison and others at the workshop spoke with cautious optimism about the third annual meeting of the U.S./Japan Forest Products Committee meeting, scheduled in Tokyo on Dec. 14. U.S. negotiators had submitted a list of 29 products of all types which they wanted discussed for tariff reduction. High on the list were softwood plywood, certain species of softwood lumber, hardwood and softwood veneer, and particleboard. Negotiators also intended to demand some response from the Japanese on plywood standards, a barrier the Japanese had said would be resolved by 1980. At press time, results of the meeting were not available.

Europe: After petroleum, wood products comprise the largest volume of imports in Europe. The United Kingdom in particular is a huge market, but the U.S. has been unable to crack it. Its share of U.K. imports is miniscule; it provides less than 1% of the softwood lumber, for example. In terms of softwood lumber exports, "the U.S. is tenth in line, behind Portugal and Poland," Ward noted.

For plywood, the picture isn't nearly as bleak. Exports to the U.K. have increased substantially—up 69% over last year, Ward said.

Fig. 1—History and Forecast* of U.S. exports of wood products
(1980 constant dollars)



Bob Hunt, director of marketing services for WWPA, predicted European lumber need is likely to increase 25 to 30% by the end of this decade. The strong trend toward timber frame construction, he said, will boost both lumber and plywood exports. The trend is prompted by a need for energy efficiency (fuel costs in Europe are 2½ times those in the U.S.). About 15% of the homes built in Europe last year used timber frame construction; that figure is forecast to rise to 30% by next year, and 70% to 80% in five years.

Middle East: The Middle East offers a relatively small market now, but it has enormous potential, Ward said. Softwood lumber demand has doubled in the past few years, and there has been a five-fold increase in plywood use in the past decade.

Producers in the West

Shipment of western products overseas results more from economic necessity than choice on the part of the producers. Some 1½ billion bd ft of western species was exported last year, and all signs indicate that volume will increase steadily. At the workshop, Hunt listed some of the reasons for the keen interest in offshore markets:

- A steep decline in domestic markets outside the West, largely due to staggering freight costs and availability of timber in Canada and the U.S. South. Western producers' share of the northeastern U.S. market has dropped from 50% 25 years ago to less than 5% today.
- Production in the region has remained high despite market erosion. To maintain production, companies must look elsewhere for markets.
- The Jones Act, which requires domestic companies to ship in American bottoms between U.S. ports, makes it more profitable for companies to ship offshore. It costs less to ship wood to Japan, for example, than it does to send it to many U.S. locations outside the western region. Although industry is waging an active campaign against the Jones Act, no amendment is in sight. Last month Sen. Mark Hatfield (R-Ore.) withdrew his bill to alter the act because he saw it as "an exercise in futility," observing, "Even if we succeed in getting such a bill through the Senate, the House will not be willing to address the issue during this Congress."

Improving profitability

Once a company decides to start exporting, what are the ways to reduce risks and increase profits? Workshop speaker Angel Diez, manager of wood products marketing for Publishers Paper Co. and president of the Pacific Lumber Exporters Assn., lists some:

1. Be strong in the marketplace. If you can't afford to operate overseas sales offices (and most companies cannot), get a good agent. He will most likely have several clients, but be sure he is looking after your interests.
2. Have a good product mix. Don't rely on just one or two products.
3. Supply top quality. Don't think of the export market as a dumping ground.
4. Export sufficient volume to keep your agent happy and to secure shipping space.
5. Specialize. Recognize that you can't be all things to all people. Pick the location where you can be strongest and concentrate your volume there.
6. Make a commitment to the market. There may be times when you could get top dollar elsewhere, but stay in the market. It will pay off in the long run, Diez said.

The need for increased commitment to the market was stressed by most workshop speakers. The U.S. has to change its reputation as an "in and out" exporter, and must overcome its fixation on the market here at home. If manufacturers improve consistency offshore and are willing to meet foreign size and standards requirements, the future for exports could indeed be a bright one. ■

New, planned and underway projects exceed $1.2 billion

That's the value calculated for new mills and remodeling jobs in the solid wood sector. Lumber represents half the figure; structural panels coming on strong

SAN FRANCISCO, CALIF.—An informal survey of forest products mill construction and modernization projects in the United States and Canada shows about US$1,215,050,000 worth of jobs either completed in 1981 or scheduled for completion this year or in the near future.

Much of this capital investment was committed before the housing crash brought virtually all of the wood industry into a period of curtailed production and low earnings. But much also reflects an undercurrent of activity—recession or no recession—aimed at getting ducks in a row for the time when economic conditions improve. The incessant need for improved lumber recovery, in the face of ever-rising raw material costs, is an important factor as well.

FOREST INDUSTRIES has tabulated this information twice in the past, with summaries appearing in our January 1979 and January 1980 issues. The same criteria were used in each case, i.e., projects completed in the year just past and those announced for future completion. In the January 1979 report there were 54 projects totaling $615.5 million, an average of $11.4 million per job. The January 1980 report contained 91 projects totaling $1.018 billion, an average of $11.19 million per entry. The tables on these pages contain 80 listings totaling the aforementioned $1.215 billion, an average of $15.19 million for each one.

An important caution should be observed in digesting this material: because of the overlapping periods involved, totals of the three published reports cannot be added together to produce an accurate capital expenditure figure for the extended period. Also, projects postponed for one reason or another, poor business being the most common reason among the current crop, may appear in more than one report.

Completion dates are as originally announced except in those cases where we have had updated information. We realize that many jobs have been postponed, scaled down or put on "slow bell" recently, and we have tried to reflect this as accurately as possible. Where no date was specified, we have indicated "future." If most of the work on a project completed in 1981 was done before the beginning of the year, we still counted it in the 1981 column.

The major source of information for the survey is the back issue file of this magazine: announcements in the *For the Record* department and feature stories describing new mills. Our "lead file" of new mill projects, maintained as a means of planning future story visits, was also consulted and produced some additional entries.

Value in most cases was stated in the pre-construction announcements and we have not attempted to make an adjust-

COMPANY AND LOCATION	TYPE OF PLANT	COMPLETION
NORTH, NORTHEAST U.S.; E. CANADA (TOTAL VALUE: US$361.24 MILLION)		
Blandin Wood Products, Grand Rapids, Minn.	Waferboard*	1982
Consolidated-Bathurst Ltd., St. Fulguence, Que.	Sawmill*	1982
Elmendorf Board Corp., Claremont, N.H.	OSB	1981
Forex-Leroy Inc., Val d'Or, Que.	Structural board	1982
Georgia-Pacific Corp., Woodland, Me.	Waferboard	1981
Grant Lumber Ltd., Englehart, Ont.	Waferboard	1982
Great Lakes Forest Products Ltd., Dryden, Ont.	Stud mill	Future
J.M. Huber Corp., Aroostook Co., Me.	Structural board	1983
Les Matériaux Blanchet, Saint-Pamphile, Que.	Sawmill	Future
Louisiana-Pacific Corp., Hayward, Wis.	Waferboard*	1982
Louisiana-Pacific Corp., Houlton, Me.	Waferboard	1982
Potlatch Corp., Bemidji, Minn.	OSB	1981
Potlatch Corp., Cook, Minn.	OSB	1982
Waferboard Corp., Timmins, Ont.	Thinboard	1982
Weyerhaeuser Co., Grayling, Mich.	Flakeboard	1982
Whitehall Plywood Corp., Whitehall, N..Y.	Plywood	1981
SOUTH ATLANTIC U.S. (TOTAL VALUE: $227.7 MILLION)		
Abitibi-Price Inc., Roaring River, N.C.	Hardboard*	1981
American Can Co., Bellamy, Ala.	Sawmill	1981
Boise Cascade Corp., Chester, S.C.	Plywood, sawmill	1981
Brunswick Pulp & Paper Co., Sterling, Ga.	Sawmill	1982
Buckeye Cellulose Corp., Barnesville, Ga.	Sawmill	1982
Chesapeake Corp. of Va., Princess Anne, Va.	Sawmill	1982
Chesapeake Plywood Inc., Pocomoke City, Md.	Plywood*	1982
Columbia-Carolina Corp., Marion, N.C.	Plywood	Future
Federal Paper Board Co., Lilesville, N C.	Plywood	1982
Federal Paper Board Co., Newberry, S.C.	Sawmill*	1981
Georgia Kraft Co., Rome, Ga.	Sawmill	1981
Georgia-Pacific Corp., Ellabelle, Ga.	Sawmill	1981
Hammermill Paper Co., Tuscaloosa, Ala.	Sawmill	1982
Holly Hill Forest Inc., Holly Hill, S.C.	Treating	1982
New South Forest Industries, Camden, S.C.	Sawmill	1982
Owens-Illinois Co., Lake Butler, Fla.	Sawmill	1981
Westvaco Corp., Summerville, S.C.	Sawmill*	1981

*Expansion or modernization

ment for inflation for postponed projects. Where cost was not specified, we made our own estimates. Values for Canadian projects were converted to U.S. dollars.

Disclaimers aside, the figures add insight to the health of the industry, suggesting that its proper place is at least in the infirmary rather than the mortuary. Some cross-tabulation also provides an edifying look at regional and product patterns.

The regional totals, the way we've broken them down, are listed in the tables. Extracting an Eastern Canada total of US$65.49 million and adding it to the Western Canada sum of US$163.51 million brings that country's listed total to US$229 million. The value of United States projects listed comes to $986.05 million.

Adding the South Central and South Atlantic totals produces $347.2 million for the South as a whole, against $343.1 million for the Western U.S. Another $295.75 million is accounted for in the Northern and Northeastern states.

Product distribution shows sawmill construction, enlargement and modernization projects accounting for a noteworthy 50.3% of the total, a figure of $610.97 million. This shows that the future of sawn wood remains promising in spite of the good press obtained by engineered wood products.

Panel totals reflect continued growth in variations on the pressed fiber theme. Plants to produce structural panels, including oriented strand board and waferboard, at $273.59 million, and other types of pressed board, at $103.98 million, together accounted for 31.1% of the grand total, or $377.57 million. Plywood manufacturing projects came to $138.1 million, 11.4% of the pie. The remaining 7.2% is composed of a variety of miscellaneous projects from treating plants to dock facilities.

Inarguably, the capital spending total calculated from the tables here is increased by projects started before the forest products recession reached its current miserable proportions. But the announcements of new projects keep filtering in, and a breakdown of figures by year of scheduled completion shows slightly more value represented by 1982 than by 1981. However, there is a sharp falloff beyond 1982, indicating a cautious approach to long-term commitments, a product of the current economic climate.

COMPANY AND LOCATION	TYPE OF PLANT	COMPLETION
SOUTH CENTRAL U.S. (TOTAL VALUE: $119.5 MILLION)		
International Paper Co., Coushatta, La.	Sawmill*	1982
International Paper Co., Durant, Miss.	Hardwood sawmill	Future
International Paper Co., Kosciusko, Miss.	Sawmill	Future
International Paper Co., Mineola, Tex.	Treating	1981
International Paper Co., Noble, La.	Sawmill	Future
International Paper Co., Springhill, La.	Sawmill, plywood	1981
Manville Forest Products Corp., Huttig, Ark.	Sawmill*	1983
WESTERN U.S. (TOTAL VALUE: $343.1 MILLION)		
Alaska Lumber & Pulp Co., Wrangell, Alaska	Sawmill*	1981
Boise Cascade Corp., Yakima, Wash.	Plywood*	1981
Burlington Northern Corp. (& Colville Confederated Tribes), Ferry County, Wash.	Sawmill	Future
Cascade West Forest Products, Olympia, Wash.	Sawmill	1981
Champion International Corp., Roseburg, Ore.	Plywood*	1983
Crown Zellerbach Corp., Omak, Wash.	Plywood*	Future
Dant & Russell Inc., Warrenton, Ore.	Sawmill*	Future
Diamond International Corp., Redmond, Ore.	Plywood*	1981
Georgia-Pacific Corp., Coquille, Ore.	Log processing	1981
Hanel Lumber Co., Hood River, Ore.	Sawmill*	1981
Edw. Hines Lumber Co., Hines, Ore.	Sawmill	1981
International Paper Co., Gardiner, Ore.	Sawmill*	1982
ITT Rayonier Inc., Hoquiam, Wash.	Dock facilities	1981
ITT Rayonier Inc., Hoquiam, Wash.	Sawmill*	1981
Kinzua Corp., Heppner, Ore.	Sawmill*	1981
Layman Lumber Co., Natches, Wash.	Sawmill*	1982
Louisiana-Pacific Corp., Rocklin, Calif.	MDF*	1981
Merritt Bros., Priest River, Ida.	Sawmill	1981
North Side Lumber Co., Philomath, Ore.	Sawmill	1982
Pine Products Inc., Prineville, Ore.	Sawmill*	1981
Pope & Talbot Inc., Oakridge, Ore.,	Sawmill*	1981
Pope & Talbot Inc., Port Gamble, Wash.	Sawmill*	1981
Pope & Talbot Inc., Spearfish, S.D.	Sawmill	1982
Seaboard Lumber Co., Seattle, Wash.	Sawmill	1981
Simpson Timber Co., Korbel, Calif.	Sawmill*	1981
Stimson Lumber Co., Forest Grove, Ore.	Sawmill	1982
Trus-Joist Corp., Eugene, Ore.	Lam. veneer lbr.*	1982
Weyerhaeuser Co., Raymond, Wash.	Sawmill	1981
Weyerhaeuser Co., Tacoma, Wash.	Dock facilities	Future
Willamette Industries, Lebanon, Ore.	Sawmill*	1981
Willamina Lumber Co., Willamina, Ore.	Sawmill*	1981
WESTERN CANADA (TOTAL VALUE: US$163.51 MILLION)		
B.C. Forest Products Ltd., Grands Cache, Alta.	Sawmill	1981
B.C. Forest Products Ltd., Knight, Alta.	Sawmill	1982
B.C. Forest Products Ltd., Maple Ridge, B.C.	Sawmill	1981
Crown Zellerbach Canada Ltd., Coquitlam, B.C.	Sawmill	1983
Lakeland Mills Ltd., Prince George, B.C.	Sawmill	1981
Northwest Panel Board Ltd., Smithers, B.C.	Thinboard	1981
Simpson Timber Co. Ltd., Blue Ridge, Alta.	Finger joint	1982
Trus-Joist Corp., Claresholm, Alta.	Lam. veneer lbr.	Future
Weldwood of Canada Ltd., 100 Mile House, B.C.	Sawmill	1982

* Expansion or modernization

Projects completed in 1981 totaled $484.33 million, 39.9% of the total. Of these, $159 million were in the South, $138.5 million in the West, $103 million in the northern states and Eastern Canada, and $83.83 million in Western Canada. The 1982 figure is $492.77 million, 40.5% of the total, broken down regionally to $218.94 million in the northern states and Eastern Canada (the influence of structural panel plants and expansions), $116 million in the West, $107.2 million in the South and another $50.63 million in Western Canada. Projects for which a 1983 completion were specified totaled $76.2 million, while those in the "future" column totaled $150.25 million. ■

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FEBRUARY 1982

FOREST INDUSTRIES

LOGGING/PULPWOOD/FORESTRY/LUMBER/PANELS

Steep-country logger fights the depression

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FOREST INDUSTRIES 1982 Volume 109 Number 2

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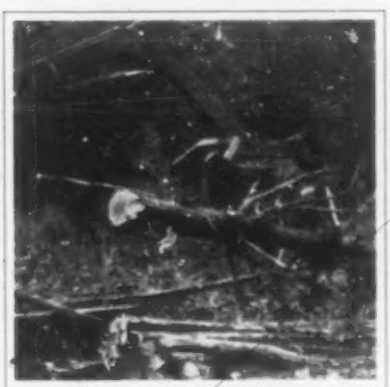

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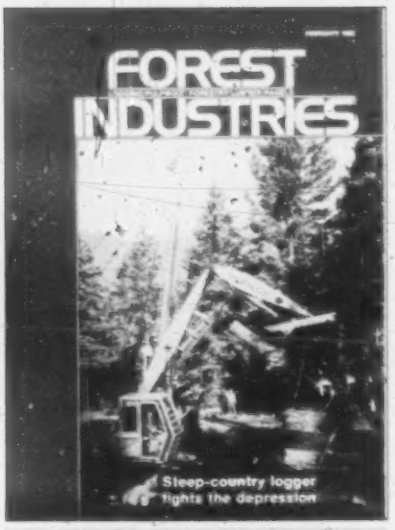

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Southern wood chip exports should undergo gradual gain

Shipments from Gulf and Atlantic ports are tied to European pulp and paper market. In 1980, volume exceeded 1.2 million tons, destined mainly for Sweden

By JAMES E. GRANSKOG
and HAROLD W. WISDOM

NEW ORLEANS, LA.—The outlook for wood chip exports from the South will be influenced largely by western Europe's consumption of pulp and paper products and how that market will be supplied, with a result that exports will increase gradually over the next several years.

Export shipments of chips from the South to Scandinavia began in the mid-1970s, and in 1980 more than 424,000 oven-dry tons valued at almost $27 million were shipped from southern ports.

Although tempered by the energy situation, projections for the next two decades indicate a large deficit for fiber-based products in western Europe, particularly within the European Economic Community. All EEC countries are net importers of wood fiber, and while internal wood supplies, utilization of residues and recycling of waste paper will increase, further growth in imports of pulp and paper products from other regions is expected.

For softwood-based products, potential supply regions for EEC nations include Scandinavia, the Soviet Union, Canada and the United States. In Scandinavia, however, timber harvests are near current annual growth. And while Canada and the Soviet Union have large reserves of softwood timber, the amount that is considered economically accessible is limited. In the United States, the South is a timber surplus region and is favorably located in relation to the European market.

TABLE 1—Volume and value of wood chips exported from the South

Year	Volume	Value	
		Total	Average
	(oven-dry tons)	(f.a.s.)	
1967	290	$6,887	$23.75
1970	9,900	180,000	18.18
1973	22	539	24.50
1974	16,212	663,227	40.91
1975	93,309	4,626,099	49.58
1976	85,639[1]	4,420,478	51.61
1977	263,890[1]	12,084,546	45.72
1978	90,434	3,829,395	42.34
1979	222,975	11,240,831	50.41
1980	424,621	26,800,515	63.12

[1]Volume includes estimated tonnage of chips shipped under nonpulpwood classifications.

Due partly to the favorable resource base and partly to other factors, including scale and integration economies, the southern pulp and paper industry is generally acknowledged to be a low-cost producer of many commodities. Such cost efficiency by itself would tend to favor the export of manufactured products rather than the raw material, particularly in light of the low value/weight ratio of wood chips.

However, development of specialized ships and efficient port facilities has aided the long-distance transportation of chips. But rising fuel prices will make transportation costs more significant in future chip shipments.

EEC tariff barriers may also play a role in potential trade patterns. Although tariffs on the average are being reduced as a result of the latest Multilateral Trade Negotiations, U.S. paper producers still face a disadvantage in competition with Scandinavian producers in the EEC market. By 1984, EEC tariffs will be eliminated for Scandinavian and other members of the European Free Trade Assn., while the tariffs for most U.S. paper products will only drop to 6-9% by 1987. U.S. pulp exports are allowed duty-free entry to the EEC, and tariffs for wood chips are scheduled to decline from 4% to 3.2%.

On balance, tariff effects will tend to favor EEC imports of pulp from the U.S. and paper products from Scandinavia. Without shifting present export markets, Scandinavia would require more chips or pulp to increase paper

shipments to the EEC. Chips from the South may be favored up to existing levels of pulping capacity, or if the prices for domestic chips approach the delivered price of southern chips. Pulp imports probably would be favored for any expansion of paper capacity—a prospect that over the long term may raise interest for Scandinavian investment in pulping facilities in the South.

Other factors may influence future chip exports as well. These include the level of economic activity in western Europe, nontariff barriers, exchange rate fluctuations and the export aggressiveness of U.S. manufacturers. Economic and monetary factors in particular may cause short-term fluctuations in shipments, such as occurred in 1978.

The net effect of all factors should be a gradual increase in southern chip exports over the next several years.

Wood chip trade: background

World trade of pulpwood in chip form is a fairly recent development. Overseas trade began in 1964 when shipments were initiated between Oregon and Japan. Total world trade in wood chips has since grown to an annual volume of 12 million m^3, or almost 5 million cords. More than 80% of that volume involves ocean shipments from various countries to Japan, while the remainder is primarily cross-border type of trade in Europe and North America.

Japan has dominated development of the wood chip trade. In the process of steadily increasing chip imports to supply its pulp industry, Japan has diversified its sources of supply. Besides the U.S. West Coast, Japan's chip suppliers include Australia, New Zealand, the Soviet Union, Indonesia, Malaysia, South Africa and Canada. Although trial shipments of chips to Japan from the South were made in 1970 and 1974, further trade did not develop until 1980.

Like Japan, Europe is a major deficit area for wood fiber. Western European nations have traditionally relied on the Scandinavian countries to supplement domestic supplies of papermaking fiber. However, booming European markets in the early 1970s caused Scandinavian pulp industry requirements to exceed domestic chip and other pulpwood supplies, stimulating their interest in new sources of raw material. At the same time, a surplus of chips developed in the U.S. South, as pulp industry requirements lagged behind rising lumber sales following the 1974-75 recession.

Trial shipments to four European countries from the South in 1975 and 1976 were followed by long-term agreements for chip sales to Sweden. Two contracts were negotiated for 2.4 million oven-dry tons over a period of six years.

Conditions in Sweden favored the import of wood fiber. Domestic chip prices, which doubled from 1973 to 1976, made wood chips from the U.S. South a feasible alternative. Also, an uneven age distribution in Swedish forests and government policies toward maintaining employment and pulp industry exports motivated use of external raw material supplies.

The long-term contracts provided the assurance required to construct chip export facilities. New chip terminals were completed at Lake Charles, La., in 1976 and Savannah, Ga., in 1977. Prior trial shipments were made primarily from bulk cargo handling facilities in Morehead City, N.C.

The volume and value of wood chips exported from southern ports through 1980 are shown in Table 1, along with the average unit value. Because the moisture content of green chips will vary, chip export volumes are recorded in oven-dry tons to provide a consistent transaction or valuation unit. Values are f.a.s. (free alongside ship) at the port of export, and include f.o.b. mill price, inland freight and port charges for placement alongside the chip vessel.

Volume figures for 1976 and 1977 include tonnage estimates for chips chipped under commodity classifications other than pulpwood in chip form. Prior to 1978, wood chips not identified as pulpwood were included with other products and reported by value only, because the category lacked a common unit of measurement. Volume estimates for these shipments were derived by dividing total values by appropriate unit values. These estimated volumes were combined with the volumes reported for the pulpwood chip category. Beginning in 1978, a revision of the export commodity classification system created a single category for all wood chips.

Exports surged in 1977 as the new chip terminals began to operate. However, shipments were curtailed in 1978 because of depressed European markets and related difficulties. This created downward pressure on prices, although some hardwood chip sales helped to reduce average prices slightly for 1977 and 1978. Shipments picked up in 1979, but still were below levels expected from long-term contracts. Spot sales to Japan helped boost shipments in 1980.

Through 1980, cumulative totals for southern chip exports exceeded 1.2 million tons and $63.8 million. As shown in Table 2, 87% of all shipments have gone to European destinations.

Chip exports to countries other than Sweden thus far have been trial or spot shipments. During 1980, Norwegian pulp companies were reportedly seeking a long-term supply agreement for southern pine wood chips. Also in 1980 there were 109,000 tons shipped to Japan under spot contracts because of escalating prices for chips from the West Coast.

Figures were developed from export records of 11 southern customs districts: Norfolk, Va.; Wilmington, N.C.; Charleston, S.C.; Savannah, Ga.; Miami and Tampa, Fla.; Mobile, Ala.; New Orleans, La.; and Port Arthur, Galveston and Houston, Texas. ■

TABLE 2—Destination of southern wood chip exports 1967-1980

Country	Volume	Percent
	(oven-dry tons)	
Sweden	967,520	80.1
Japan	135,358	11.2
Finland	41,160	3.4
Italy	30,883	2.6
France	16,109	1.3
Venezuela	15,481	1.3
Others	781	.1
Total	1,207,292	100.0

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APRIL 1982

FOREST INDUSTRIES

LOGGING PULPWOOD FORESTRY LUMBER PANELS

1982 Panel Review

Oriented strand board—new panel product in U.S.

FOREST INDUSTRIES *1982 Volume 109 Number 4*

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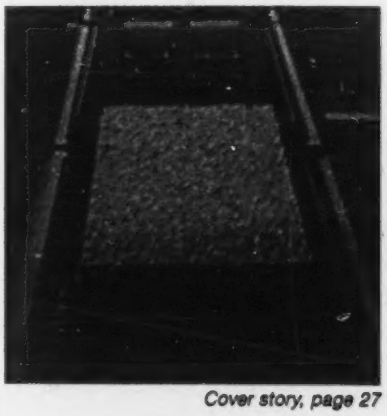

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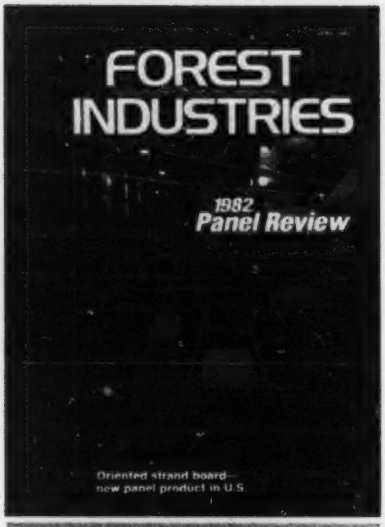

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Faith, intuition, good selling help cope with panel market

Even that combo isn't always enough to keep a plant running these days. If you don't want to call the panel market 'terrible,' just say the situation is 'fluid'

By HERB LAMBERT
Editor

SAN FRANCISCO, CALIF.—Coping with the panel market in 1981—and even now, into the first half of 1982—has called for Superman capacity. It takes religious faith, seat-of-the-pants intuition, intensified marketing and a host of other things.

Even so, that combination could not forestall some panel plant closures, nor stave off slow-bell operations. Panels may not have suffered the effects of the market as much as lumber, but they were not much better off.

This situation brings to mind a military phrase: "The situation is fluid."

That could mean our forces are advancing. Or it could mean the enemy is on the offensive. Maybe there are momentary stalemates. Or it could mean there is some backpedaling going on. For the most part, the phrase means, "We just don't know what the hell is happening."

It should be added, just so forest industry and military people don't feel singled out, that most of the nation's economists and market experts can't offer definitive and lasting forecasts.

1981: a terrible year

So much for a so-called introduction to this review of 1981 in the panel sector. In short, 1981 was a terrible year, and a confused one.

It wasn't entirely black, however. There were a few announcements other than closures, and as 1982 dawned, there were some feelings that its last half will see improvement. It won't be vigorous, but it will be encouraging.

As for production data, a glance at the 1971-81 summary table on this page shows that medium-density fiberboard (MDF) fared better than the other panel products. Production of 513 million ft² in 1981 was just about equal to 1980. In fact, 1981 showed a tiny advance, but hardly enough to crow about: the 513-million figure is listed for both years.

MDF seems to be enjoying at least some of the market acceptance which put particleboard on the zoom in the 1960s and early '70s. The Cleveland, Ohio-based market research firm, Predicasts Inc., estimates MDF shipments will reach nearly 2 billion ft² by 1995.

The highest-volume panel product, softwood plywood, scored an estimated 17.013 billion ft² in 1981, up from 1980's 16.468 billion. If the early-1982 outlook is borne out, 1982 production will top 18 billion ft² slightly.

Hardwood plywood registered 1.1 billion ft² in 1981, down from the 1.312 billion ft shipped in 1980.

Hardboard output varied only modestly, with 1981 production estimated at 1.104 billion ft², compared with 1.14 billion in 1980—a difference of just 46 million ft².

The gap was wider for particleboard. Production fell by 108 million ft² in 1981—2.921 billion ft last year, compared with 3.029 billion in 1980.

Statistics on insulation board were not available.

Canadians also hurting

The panel sector in Canada shared in the market stress U.S. companies suffered. The situation north of the border was further aggravated by a six-week strike.

Structural panel production for 1981 for all of Canada was estimated at 2.25 billion ft², compared with 2.6 billion ft²

Production—1971-1981
(sq ft)

Year	Particleboard ¾-in. basis	Hardboard ⅛-in. basis	MDF ¾-in. basis	Softwood plywood ⅜-in. basis	Hardwood plywood surface measure
1971	2,393,760,000	5,224,769,000	—	16,634,971,000	2,040,242,000
1972	3,116,944,000	5,798,376,000	—	18,323,754,000	2,223,182,000
1973	3,493,648,000	6,475,387,000	—	18,304,599,000	2,048,362,000
1974	3,103,800,000	6,056,542,000	—	15,878,380,000	1,644,043,000
1975	2,538,934,000	6,237,908,000	215,496,000	16,050,180,000	1,279,592,000
1976	3,202,200,000	7,066,022,000	280,036,000	18,400,000,000	1,463,135,000
1977	3,592,210,000	7,200,000,000	441,354,000	19,300,000,000	1,478,000,000
1978	3,610,000,000	7,800,000,000	480,000,000	19,760,000,000	1,480,571,000
1979	3,300,000,000	7,687,798,000	490,000,000	19,750,000,000	1,434,521,000
1980	3,029,000,000	6,140,000,000	513,000,000	16,468,000,000	1,312,000,000
1981	2,921,000,000	6,104,000,000	513,000,000	17,013,000,000	1,100,000,000

Wood-based panel plants—U.S.-Canada

Data received by Feb. 28, 1982

State or Province	Swd. Ply.	Hwd. Ply.	Particle-board	Hard-board	Insul. Board	MDF	Thin Panel	Water-board	Com-posite
Alabama	9	4	4		1	1			
Arkansas	8	4	2	1			1		
California	7	9	5	1		1	1		
Florida	2	1	1						
Georgia	5	5	3		1		1		
Idaho	5	2	1						1
Indiana		4	1						
Iowa					1				
Kentucky		2	1						
Louisiana	15	2	3						
Maine					1			1	
Maryland	1								
Massachusetts									
Michigan	1	5	1	1					
Minnesota		1	1	3	2	1	1	2	
Mississippi	6	2	3	1	2		1		
Missouri					1				
Montana	4		1			1			
New Hampshire		1	1						
New Jersey		1							
New Mexico			2						
New York	1	2				1	1		
North Carolina	5	26	2	2	1	2	1		1
Oklahoma	1		1		1	1			
Oregon	71	7	11	6	2	1			2
Pennsylvania		1	1	1	1	1			
South Carolina	3	14	1	1		2			
Tennessee		5	1	1					
Texas	11	2	2	1	1				
Vermont		3							
Virginia	1	10	6	2	2				
Washington	21	4	1	1					
West Virginia									
Wisconsin		11	2	2			1	1	
Total	**177**	**126**	**58**	**24**	**17**	**12**	**8**	**4**	**4**
Alberta	3				2				
British Columbia	22	1	2	1					
Manitoba									
New Brunswick	1		1				1	1	
Newfoundland		1							
Nova Scotia				1					
Ontario	3	8	7	1	1	1	1	5	1
Saskatchewan	1							1	
Quebec	1	7	1	1	3			1	
Total	**31**	**17**	**11**	**4**	**6**	**1**	**2**	**9**	**1**
Grand total	**208**	**143**	**69**	**28**	**23**	**13**	**10**	**13**	**5**

in 1980. British Columbia, the dominant wood products province, produced 1.95 billion ft² of panels, down from 2.2 billion in 1980.

What about the other panel products: flakeboard, waferboard, composite board and oriented strand board? We have no specific figures, but just listing them emphasizes the transition in the panel industry. "Structural" has become the key word. It's not a new word, but it is becoming the accepted term because the thrust now seems to be to design a panel for an end use, regardless of what raw material may go into it.

Consider only end use

Prof. Tom Maloney of Washington State University in Pullman directs the International Particleboard Symposium held there every year, an event which draws worldwide attendance.

Maloney, a recognized authority on panels, says this about end use: "Define the end use of a product, then make it to meet the appropriate specifications. Do not be concerned about how to make the product or about the various components of the product. The objective is simply to make a product which meets the end use specifications."

Maloney cites, as evidence of this approach, the Performance Standards promulgated by the American Plywood Assn. covering waferboard, composite boards, flakeboard, coventional particleboard made from shavings and the association's softwood plywood.

There has been talk for many years about reconstituted wood being the answer to many challenges: resource utilization, maximum quality control in production, better performance in specific applications and others. It would appear that we're approaching this destination with increasing speed.

Who knows, we may be approaching an era in which panels are divided into only two categories: structural and nonstructural. It will be interesting to follow the advances in the years immediately ahead.

Another industry milestone?

The current transition in the panel sector may someday be considered as a milestone in that part of the solid wood products industry. Somewhat the same thing might be said for softwood plywood in light of changes since production began in the South.

Until 1964, the softwood plywood industry was a five-state entity. Oregon led in production volume, followed in order by Washington, California, Idaho and Montana. In 1964, plywood production started in Arkansas.

The newcomer added 65 million ft² in 1964 to the West's 11.599 billion ft². By 1980, APA figures showed the original five western states producing 8.919 billion ft, while southern states produced 7.393 billion. And some plywood was being made in Great Lakes states.

A variety of factors is involved, including timber supply and, possibly more importantly, timber availability. Other factors: markets, freight rates and technical innovations. Some or all of these factors will strongly influence any expansion of the reconstituted board industry.

1981's bright spots

Despite shutdowns and slowdowns, 1981 offered some bright spots. Among them are these, gleaned from the year's news releases:

- J.M. Huber Corp. will build a structural waferboard plant, to cost about $30 million, in Easton, Maine. Scheduled to start up early in 1983, the NGM International-designed plant will be the first in the U.S. to use a caulless forming line.
- An MDF plant at Las Vegas, N.M., is slated to start up in 1984. The plant will have a capacity of 72 million ft² a year. Meadows Resources Inc. and Frontier Fiber Inc. are partners in the plant.
- New York State's first softwood plywood plant, Whitehall Plywood Co. in Whitehall, began peeling veneer this year.
- The former Edward Hines plywood plant at Westfir, Ore., down for two years after a fire, is now open again as West Ridge Plywood Co.
- International Paper Co. started up its Springhill, La., plywood plant which can produce 180 million ft² annually.
- Louisiana-Pacific Corp. plans to double the capacity of its waferboard plant at Hayward, Wis., to 260 million ft², and build another waferboard plant at Houlton, Maine.
- Elmendorf Board Corp. has started making oriented strand board (OSB) at Claremont, N.H.
- Potlatch Corp. began making OSB in Bemidji, Minn., and is building a second OSB plant at Cook, Minn.
- Columbia Plywood Corp. recently announced a plywood plant, part of a multi-mill complex, at Marion, N.C. Yellow poplar will be the raw material.
- The Chesapeake Corp. of Virginia finished expanding its plywood plant at Pocomoke City, Md., this year.
- Panofor Ltd., a subsidiary of Forex LeRoy Ltd., is building a waferboard plant at Val d'Or, Que. Panofor said it will be the world's first waferboard plant to use horizontal disc waferizers and a caulless belt forming line. Aspen, birch and poplar will be the furnish.

The three-year-old drop in homebuilding has hurt panels as well as lumber. But two things seem to have kept panels from suffering equally: marketing efforts aimed at non-residential uses and at increasing exports.

Marketing push continues

The push continues in these two important areas, and 1982 should see even better results than last year's. An expected modest upturn in housing by the second half of this year suggests a more encouraging outlook for 1982.

Nowhere in this roundup has there been mention of specific mills or plants being shut down, sold or mothballed. Such things certainly happened, but it would be difficult to identify each mill affected, and even harder to try to say when it was working or down, or for how long. Some plants are, even now, up for sale. Some have been sold. Others have been cannibalized. The machinery has been sold out of some, leaving only the plant shell.

We emphasize this point because readers will not be able to reconcile the figures in the "universe" table on page 25 with the panel directory on pages 46-49. Some of the plants listed in the directory will not reopen, so they are lost from the total count.

Overall, however, we prefer to use the glass-half-full approach to the glass-half-empty theory, so we have kept our listings more or less intact. The totals in the state/province "universe" table reflect information from various sources. They cannot be matched with plants named in the directory.

The editors of FOREST INDUSTRIES have started trying to pin down more precisely the "panel universe" between now and next year's report, due in the April 1983 issue. We hope readers will tell us of changes, or of omissions and errors—whether about their own plants or those of other companies. ■

Directory of Panel Plants—U.S.

HARDWOOD PLYWOOD

C & B Plywood Co., Abbeville, Ala.
Union Camp Corp., Chapman, Ala.
Taylor Veneer Co., Demopolis, Ala.
Howell Plywood Corp., Dothan, Ala.
Thompson & Swaim Plywood, Tuscaloosa, Ala.

Cotton Plant Plywood Co., Cotton Plant, Ark.
Masonite Corp., Warren, Ark.
McKnight Plywood, West Helena, Ark.
Weyerhaeuser Co., West Memphis, Ark.

West Coast Plywood Co., Azusa, Calif.
Louisiana-Pacific Corp., Burney, Calif.
Birchwood of Los Angeles, Inc. City of Commerce, Calif.
Sunset Plywood Inc., Los Angeles, Calif.
Architectural Plywood Inc., North Hollywood, Calif.
Stewart Plywood Co., Santa Fe Springs, Calif.
General Veneer Mfg. Co., South Gate, Calif.
Plywood Mfg. Co. of Calif., Torrance, Calif.

Florida Plywoods, Greenville, Fla.
Jackson Veneer Inc., Laurel Hill, Fla.

Day Plywood Inc., Cuthbert, Ga.
Georgia Plywood Co., Dublin, Ga.
Patat Plywood Corp., Rockmart, Ga.
Bradley Plywood Corp., Savannah, Ga.
Georgia-Pacific Corp., Savannah, Ga.

Sioux Veneer Panel Co., Boise, Idaho
Idaho Veneer Co., Post Falls, Idaho

Anderson Trading Co., Northbrook, Ill.

Jasper Laminates, Jasper, Ind.
Jasper Wood Products Co., Jasper, Ind.
Hoosier Panel Co., New Albany, Ind.
Paramount Plywood Products, New Albany, Ind.

Cumberland Forest Products, London, Ky.
Jefferson Wood Working Co., Louisville, Ky.

Huber Corp., J.M., Patten, Maine

Plycraft Inc., Lawrence, Mass.

Iron Wood Products Corp., Bessemer, Mich.
Davidson Plyforms Inc., Grand Rapids, Mich.
Dodge Veneers Inc., Grand Rapids, Mich.
Plycurves Inc., Grand Rapids, Mich.

Buffalo Veneer & Plywood Co., Buffalo, Minn.
Mill City Plywood Co., Minneapolis, Minn.

Perry County Plywood Co., Beaumont, Miss.
D & L Veneers Inc., Collins, Miss.
Chicago Mill & Lumber Co., Greenville, Miss.
Pavco Industries, Pascagoula, Miss.
Quality Plywood Co. Inc., Waynesboro, Miss.

Keller Products Co., Manchester, N.H.

Yonkers Plywood Mfg. Corp., Old Bridge, N.J.

U.S. Veneer Co. Inc., Bronx, N.Y.
Jamestown Plywood Corp., Jamestown, N.Y.

Doxey Furniture Co., Aberdeen, N.C.
Carolina Plywood Co., Apex, N.C.
Benson Veneer Co., Benson, N.C.
Calypso Plywood Co., Calypso, N.C.
Chowan Veneer Co., Edenton, N.C.
Rankin Bros. Co., Fayetteville, N.C.
Hayworth Roll & Panel Co., High Point, N.C.
Genwove, Indian Trail, N.C.
National Veneer Co., Lenoir, N.C.
Carolina Panel Co., Lexington, N.C.
Hasty Plywood Co., Maxton, N.C.
Laminated Wood Corp., New Bern, N.C.
Columbia Plywood Co., Old Fort, N.C.
Denny Plywood Co., Roseboro, N.C.
Davis Wood Products, Rowland, N.C.
Rural Hall Veneer Co., Rural Hall, N.C.
Statesville Plywood & Veneer, Statesville, N.C.
Columbia Panel Mfg. Co., Thomasville, N.C.
Ingram Plywoods Inc., Thomasville, N.C.
McLeod Plywood Box Co., Wadesboro, N.C.
Weldon Veneer Co., Weldon, N.C.
Whiteville Plywood Co., Whiteville, N.C.
Southern Inc., Wilmington, N.C.
Sperry & Hutchinson Furn. Co., Windsor, N.C.
Beck Bros. Veneer Co., Zebulon, N.C.

Georgia-Pacific Corp., Eugene, Ore.
States Veneer Co., Eugene, Ore.
Southern Oregon Plywood, Grants Pass, Ore.
Columbia Plywood Corp., Klamath Falls, Ore.
Timber Products Co., Medford, Ore.
Louisiana-Pacific Corp., Tillamook, Ore.

Masonite Corp., Watsontown, Pa.

Champion International, Charleston, S.C.
Standard Plywoods Inc., Clinton, S.C.
Furniture Veneers Inc., Conway, S.C.
Stilley Plywood Co., Conway, S.C.
Darlington Veneer & Plywood Co., Darlington, S.C.
Dillon Veneer & Plywood Co., Dillon, S.C.
King Veneer Co., Florence, S.C.
Sumter Veneer Co., Florence, S.C.
Tinsley Plywood Corp., Florence, S.C.
Tyler Plywood Corp., Florence, S.C.
Drexel Heritage Furniture, Kingstree, S.C.
Champion International, Orangeburg, S.C.
Marsh Plywood Corp., Pamplico, S.C.
Georgia-Pacific Corp., Sumter, S.C.
Winnsboro Plywood Inc., Winnsboro, S.C.

Panoply Corp., Lexington, Tenn.
Memphis Plywood Corp., Memphis, Tenn.
Southern Laminating Co., Memphis, Tenn.
Speltz Plywood Corp., Memphis, Tenn.
Tri-State Veneer & Plywood Co., Memphis, Tenn.

Center Plywood Co., Center, Texas
Triangle Pacific Corp., Center, Texas
Champion International, Galveston, Texas

Bradford Veneer & Panel Co., Bradford, Vt.
Weyerhaeuser Co., Hancock, Vt.
Rutland Plywood Corp., Rutland, Vt.

Lane Co. Inc., Altavista, Va.
Atkins Plywood Inc., Atkins, Va.
Burkeville Veneer Co., Burkeville, Va.
Whittle Plywood Corp., Chatham, Va.
Danville Plywood Corp., Danville, Va.
Eastern Door & Panel Corp., Danville, Va.
Multi-Ply Corp., Danville, Va.
Plywood Panels Inc., Norfolk, Va.
Henry County Plywood Corp., Ridgeway, Va.
Lane Co. Inc., Rocky Mount, Va.

Mt. Baker Plywood Inc., Bellingham, Wash.
Champion International, Seattle, Wash.
Buffelen Woodworking Co., Tacoma, Wash.
North Pacific Plywood Inc., Tacoma, Wash.

Allegheny Lumber Co., Elkins, W. Va.

Birchwood Lbr. & Veneer Co., Birchwood, Wis.
Lenderink Inc., Gillett, Wis.
Warvel Products, Gillett, Wis.
Marion Plywood Corp., Marion, Wis.
Weyerhaeuser Co., Marshfield, Wis.
Wisconsin Timber & Land Co., Mattoon, Wis.
Pluswood, Inc., Oshkosh, Wis.
Wisconsin Laminates, Pewaukee, Wis.
Birchwood Mfg. Co., Rice Lake, Wis.
Weber Veneer & Plywood Co., Shawano, Wis.
Lullabye Furniture Co., Stevens Point, Wis.
Eggers Plywood Co., Two Rivers, Wis.

SOFTWOOD PLYWOOD

Company & plants	Capacity*
Georgia-Pacific Corp., Portland, Ore.	
Monticello, Ga.	245
Taylorsville, Miss.	244
Georgia-Pacific Corp. (cont.)	
Fordyce, Ark.	230
Gloster, Miss.	230
Warm Springs, Ga.	215
Louisville, Miss.	215
Crossett, Ark.	202
Georgia-Pacific Corp. (cont.)	
Monroeville, Ala.	200
Crossett, Ark.	198
Talladega, Ala.	190
Whiteville, N.C.	180
Coquille, Ore.	180

* Est. annual capacity (+000,000)

SOFTWOOD PLYWOOD (cont.)

Company & plants	Capacity*
Georgia-Pacific Corp. (cont.)	
Emporia, Va.	180
Russellville, S.C.	175
Logansport, La.	160
Springfield, Ore.	160
Toledo, Ore.	140
Chiefland, Fla.	115
Prosperity, S.C.	115
Champion International, Stamford, Conn.	
Bonner, Mont.	300
Lebanon, Ore.	228
Corrigan, Texas	221
Camden, Texas	198
Roseburg, Ore.	170
Gold Beach, Ore.	150
Newberry, S.C.	150
Hammond, La.	98
Anderson, Calif.	90
Cordova, Ala.	85
Willamina, Ore.	78
Waycross, Ga.	66
Seattle, Wash.	26
Boise Cascade Corp., Boise, Idaho	
Medford, Ore.	250
Elgin, Ore.	154
Chester, S.C.	150
Kettle Falls, Wash.	150
Yakima, Wash.	130
DeQuincy, La.	124
Independence, Ore.	123
Emmett, Idaho	100
White City, Ore.	100
Albany, Ore.	81
Camp Adair, Ore.	81
Valsetz, Ore.	81
Moncure, N.C.	80
Sweet Home, Ore.	60
Willamette Industries, Portland, Ore.	
Dallas, Ore.	150
Foster, Ore.	142
Dodson, La.	113
Zwolle, La.	107
Emerson, Ark.	105
Lebanon, Ore.	105
Springfield, Ore.	96
Philomath, Ore.	84
Lebanon, Ore.	78
Natchitoches, La.	77
Ruston, La.	77
Sweet Home, Ore.	60
Weyerhaeuser Co., Tacoma, Wash.	
North Bend, Ore.	200
Longview, Wash.	
Mountain Pine, Ark.	
Livingston, Ala.	100
Jacksonville, N.C.	100
Plymouth, N.C.	100
Wright City, Okla.	100
Snoqualmie Falls, Wash.	95
Klamath Falls, Ore.	88
Dierks, Ark.	
Springfield, Ore.	85
Cottage Grove, Ore.	80
Philadelphia, Miss.	54
International Paper Co., Dallas, Texas	
Gurdon, Ark.	200
Springhill, La.	200
Wiggins, Miss.	130
International Paper Co. (cont.)	
Nacogdoches, Texas	110
Gardiner, Ore.	90
Roseburg Lumber Co., Roseburg, Ore.	
Dillard, Ore. (2)	320
Riddle, Ore.	260
Coquille, Ore.	125
Roseburg, Ore.	107
Louisiana-Pacific Corp., Portland, Ore.	
Urania, La.	220
New Waverly, Texas	208
Lufkin, Texas	140
Tillamook, Ore.	100
Standard, Calif.	68
Kirby Forest Industries, Houston, Texas	
Bon Weir, Texas	275
Cleveland, Texas	180
Silsbee, Texas	150
Southwest Forest Industries, Phoenix, Ariz.	
Albany, Ore.	185
Grants Pass, Ore.	150
Grants Pass, Ore.	120
White City, Ore.	120
White City, Ore.	110
Potlatch Corp., San Francisco, Calif.	
St. Maries, Idaho	176
Pierce, Idaho	153
Lewiston, Idaho	152
Temple-Eastex, Diboll, Texas	
Pineland, Texas	164
Diboll, Texas	153
Medford Corp., Medford, Ore.	
Medford, Ore.	185
Grants Pass, Ore.	100
Grants Pass, Ore.	96
Vancouver Plywood Co., Florien, La.	
Florien, La.	175
Oakdale, La.	175
Crown Zellerbach Corp., San Francisco, Calif.	
Joyce, La.	208
Omak, Wash.	120
Brand-S Corp., Corvallis, Ore.	
Corvallis, Ore.	108
Springfield, Ore.	105
Corvallis, Ore.	88
Georgia Kraft Co., Madison, Ga.	
Simpson Timber Co., Seattle, Wash.	
Fairhaven, Calif.	100
McCleary, Wash.	100
Albany, Ore.	72
Shelton, Wash.	34
Plum Creek Lumber Co., Columbia Falls, Mont.	
Kalispell, Mont.	120
Columbia Falls, Mont.	110
Bohemia Inc, Eugene, Ore.	
Culp Creek, Ore.	95
Drain, Ore.	85
Junction City, Ore.	80
Kogap Mfg. Co., Medford, Ore.	
Diamond International Corp., Bend, Ore.	
Redmond, Ore.	113
Red Bluff, Calif.	64
Manville Forest Products, Denver, Colo.	
Winnfield, La.	100
Huttig, Ark.	70
Publishers Forest Products Co.,	
Anacortes, Wash.	165
Timber Products Co., Medford, Ore.	
Grants Pass, Ore.	108
White City, Ore.	55
Lane Plywood Co., Eugene, Ore.	162
Robert Dollar Co., Glendale, Ore.	160
Multnomah Ply. Co., St. Helens, Ore.	150
Scotch Ply. Co. of Ala., Fulton, Ala.	150
Ft. Vancouver Ply. Co., Vancouver, Wash.	144
North Santiam Ply. Co., Mill City, Ore.	144
Union Camp Corp., Chapman, Ala.	130
Hardel Mutual Ply. Corp., Olympia, Wash.	120
Stevenson Co-Ply, Stevenson, Wash.	108
Peninsula Ply. Co., Port Angeles, Wash.	103
MacMillan Bloedel Inc., Pine Hill, Ala.	100
Great Southern Plywood Inc.,	
Cedar Springs, Ga.	100
Owens-Illinois Inc., Jasper, Texas	100
Delta Pine Ply. Co., Beaumont, Miss.	100
Fourply Inc., Grants Pass, Ore.	100
South Coast Lbr. Co., Brookings, Ore.	
Anderson Plywood Co., Hines, Ore.	90
Rosboro Lbr. Co., Springfield, Ore.	90
Evans Products Co., Aberdeen, Wash.	90
North Pacific Ply. Inc., Tacoma, Wash.	85
American Forest Prod. Co., Martell, Calif.	84
St. Regis Paper Co., Libby, Mont.	80
Miller Redwood Co., Merlin, Ore.	80
Lang & Gangnes Corp., White City, Ore.	77
TMA Forest Prod. Group, Andalusia, Ala.	72
Warm Springs Forest Products	
Warm Springs, Ore.	72
Alpine Veneers Inc., Portland, Ore.	66
Mt. Baker Ply. Co., Bellingham, Wash.	65
Coast Range Plywood, McMinnville, Ore.	60
Chesapeake Bay Plywood Corp., Pocomoke City, Md.	60
Lacey Plywood Co. Inc., Lacey, Wash.	60
Puget Sound Ply. Inc., Tacoma, Wash.	60
Hoquiam Plywood Co., Hoquiam, Wash.	56
Coos Head Timber Co., Coos Bay, Ore.	42
Pacific Lumber Co., Scotia, Calif.	40
Cloverdale Products Co.,	
Cloverdale, Calif.40	
The Singer Co., Trumann, Ark.	
General Veneer Mfg. Co., South Gate, Calif.	
Sperry & Hutchinson Furniture Co.,	
Windsor, N.C.	
Mt. Jefferson Plywood Co., Salem, Ore.	
Bingen Plywood Co., Bingen, Wash.	
Centralia Ply. & Veneer, Centralia, Wash.	
Elma Plywood Corp., Elma, Wash.	
Textured Forest Products, Washougal, Wash.	
Whitehall Plywood Corp., Whitehall, N.Y.	
Hunt Plywood Co., Pollock, La.	
Coastal Lumber Co., Havana, Fla.	

* Est. annual capacity (+000,000)

PARTICLEBOARD

Company & plants	Capacity*
Weyerhaeuser Co., Tacoma, Wash.	
Klamath Falls, Ore.	100
Springfield, Ore.	100
Adel, Ga.	82
Marshfield, Wis.	65
Broken Bow, Okla.	
North Bend, Ore.	
Louisiana-Pacific Corp., Portland, Ore.	
Arcata, Calif.	160
Corrigan, Texas	105
Urania, La.	100
Missoula, Mont.	100

PARTICLEBOARD (cont.)

Company & plants	Capacity*
Georgia-Pacific Corp., Portland, Ore.	
Russellville, S.C.	108
Vienna, Ga.	105
Crossett, Ark.	95
Taylorsville, Miss.	86
Louisville, Miss.	74
Temple-Eastex, Diboll, Texas	
Diboll, Texas	100
Thomson, Ga.	100
Monroeville, Ala.	100
Champion International, Stamford, Conn.	
Gaylord, Mich.	175
Oxford, Miss.	141
South Boston, Va.	84
Willamette Industries, Portland, Ore.	
Albany, Ore.	171
Bend, Ore.	140
Simsboro, La.	66
Roseburg Lumber Co.,	
Dillard, Ore. (2)	280
Union Camp Corp., Wayne, N.J.	
Chapman, Ala.	100
Franklin, Va.	75
Masonite Corp., Chicago, Ill.	
Waverly, Va.	100
Stuart, Va.	60
Boise Cascade Corp.,	
LaGrande, Ore.	154
Bohemia Inc., Eugene, Ore.	130
American Forest Products Corp.,	
Martell, Calif.	110
Manville Forest Products, Denver, Colo.	
Lillie, La.	100
MacMillan Bloedel, Pine Hill, Ala.	100
Timber Products Co., Medford, Ore.	96
Down River Forest Industries,	
White City, Ore.	75
Kirby Forest Industries,	
Silsbee, Texas	73
Potlatch Corp., San Francisco, Calif.	
Post Falls, Idaho	72
Bemidji, Minn.	
Ponderosa Products, Albuquerque, N.M.	45
Wickes For. Ind., San Diego, Calif.	
Chowchilla, Calif.	37
Hambro Forest Products,	
Crescent City, Calif.	29
Collins Pine Co., Portland, Ore.	
Chester, Calif.	28
Navajo Forest Products,	
Navajo, N.M.	25
Rodman Industries, Marinette, Wis.	24
Broyhill Industries, Lenoir, N.C.	22
The Singer Co., Atlanta, Ga.	
Trumann, Ark.	22
Publishers For. Prod. Oregon City, Ore.	
Philomoth, Ore.	20
Nu-Woods Inc., Lenoir, N.C.	16
Swain Industries, Evanston, Ind.	15
Florida Plywoods, Greenville, Fla.	11
Giles & Kendall, Huntsville, Ala.	10
Jasper American Mfg. Co., Jasper, Ind.	
Henderson, Ky.	9
American Furn. Co., Martinsville, Va.	
Woodcore Inc., Scottsdale, Pa.	
Lane Co., Altavista, Va.	
Williams Lbr. Co., East Edington, Maine	

* Est. annual capacity (+000,000)

HARDBOARD

Company & plants	Capacity*
Masonite Corp., Chicago, Ill.	
Laurel, Miss.	1,850
Ukiah, Calif.	580
Towanda, Pa.	300
Superwood Corp., Duluth, Minn.	
Duluth, Minn.	500
North Little Rock, Ark.	130
Bemidji, Minn.	100
Phillips, Wis.	81
Boise Cascade Corp., Boise, Idaho	
International Falls, Minn.	800
Georgia-Pacific Corp., Portland, Ore.	
Coos Bay, Ore.	265
Jarratt, Va.	231
Conway, N.C.	207
Abitibi-Price, Troy, Mich.	
Alpena, Mich.	450
Roaring River, N.C.	165
Weyerhaeuser Co., Tacoma, Wash.	
Doswell, Va.	315
Klamath Falls, Ore.	195
Broken Bow, Okla.	
Champion International, Stamford, Conn.	
Catawba, S.C.	237
Lebanon, Ore.	116
Hood River, Ore.	88
Temple-Eastex, Diboll, Texas	421
U.S. Gypsum Co., Chicago, Ill.	
Greenville, Miss.	150
Pilot Rock, Ore.	50
Danville, Va.	
Publishers For. Prod., Oregon City, Ore.	
Portland, Ore.	
Sweet Home, Ore.	
Anacortes, Wash.	60
Louisiana-Pacific Corp., Portland, Ore.	
Oroville, Calif.	169
Superior Fiber Products,	
Superior, Wis.	148
Evans Products Co., Portland, Ore.	
Corvallis, Ore.	125
Stimson Lbr. Co., Forest Grove, Ore.	
Scoggin Valley, Ore.	114
Celotex Corp., Tampa, Fla.	
Paris, Tenn.	74

INSULATION BOARD

Company & plants	Capacity*
Armstrong Cork Co., Lancaster, Pa.	
Macon, Ga.	
Gold Bond Building Products,	
Mobile, Ala.	300
U.S. Gypsum Co., Chicago, Ill.	
Lisbon Falls, Maine	120
Pilot Rock, Ore.	100
Greenville, Miss.	45
Danville, Va.	
Celotex Corp., Tampa, Fla.	
Sunbury, Pa.	200
Dubuque, Iowa	130
Owens-Corning Fiberglas, Toledo, Ohio	
Meridian, Miss.	220
Boise Cascade Corp., Boise, Idaho	
International Falls, Minn.	200
Kaiser Gypsum, Oakland, Calif.	
St. Helens, Ore.	150
Temple-Eastex, Diboll, Texas	105

INSULATION BOARD

Company & plants	Capacity*
Weyerhaeuser Co., Tacoma, Wash.	
Broken Bow, Okla	
Heubert Fibreboard,	
Boonville, Mo.	54
Conwed Corp., St. Paul, Minn.	
Cloquet, Minn.	
Homosote, Trenton, N.J.	

MDF

Company & plants	Capacity*
Masonite Corp., Chicago, Ill.	
Towanda, Pa.	
Spring Hope, N.C.	
Georgia-Pacific Corp., Portland, Ore.	
Holly Hill, S.C.	75
Weyerhaeuser Co., Tacoma, Wash.	
Broken Bow, Okla.	
Moncure, N.C.	65
Louisiana-Pacific Corp., Portland, Ore.	
Eufaula, Ala.	60
Rocklin, Calif.	60
Celotex Corp., Tampa, Fla.	
Marion, S.C.	70
Deposit, N.Y.	40
Medford Corp.,	
Medford, Ore.	90
Plum Creek Lumber Co.,	
Columbia Falls, Mont.	80
ANNOUNCED:	
Frontier Fiber, Las Vegas,	
N.M.	72

THIN PANELBOARD

Company & plants	Capacity*
Georgia-Pacific Corp., Portland, Ore.	
Monticello, Ga.	320
Whiteville, N.C.	196
Taylorsville, Miss.	44
Superwood Corp.,	
Duluth, Minn.	85
Pluswood Inc.,	
Oshkosh, Wis.	72
Celotex Corp., Tampa, Fla.	
Deposit, N.Y.	30

WAFERBOARD

Company & plants	Capacity*
Georgia-Pacific Corp., Portland, Ore.	
Woodland, Maine	166
Louisiana-Pacific Corp., Portland, Ore.	
Hayward, Wis.	260
Houlton, Maine	120
Blandin Wood Prod., Grand Rapids, Minn.	
Northwood Panelboard,	
Grand Rapids, Minn.	100
ANNOUNCED:	
Huber Corp., J.M., Easton, Maine	130

COMPOSITE BOARD

Company & plants	Capacity*
Georgia-Pacific Corp., Portland, Ore.	
Dudley, N.C.	200
Potlatch Corp., San Francisco, Calif.	
Lewiston, Idaho	
Bemidji, Minn.	150
Cook, Minn.	150
Elmendorf Board Corp., Claremont, N.H.	100
Plyboard, Brownsville, Ore.	90
Ellingson Timber Co., Baker, Ore.	

Directory of Panel Plants—Canada

SOFTWOOD PLYWOOD

Company & plants	Capacity*
Weldwood of Canada Ltd., Vancouver, B.C.	
Vancouver, B.C.	185
Quesnel, B.C.	145
Surrey, B.C.	130
Williams Lake, B.C.	120
100 Mile House, B.C.	115
Longlac, Ont.	55
Crown Zellerbach Canada, Vancouver, B.C.	
Armstrong, B.C.	135
New Westminster, B.C.	130
Kelowna, B.C.	85
Canadian Forest Products, Vancouver, B.C.	
New Westminster, B.C.	223
Grand Prairie, Alta.	80
MacMillan Bloedel Ltd., Vancouver, B.C.	
Port Alberni, B.C.	183
Vancouver, B.C.	120
B.C. Forest Products, Vancouver, B.C.	
Victoria, B.C.	125
New Westminster, B.C.	90
Evans Products Co., Kamloops, B.C.	
Golden, B.C.	120
Savona, B.C.	36
Richmond Plywood Corp.	
Richmond, B.C.	175
North Central Plywoods Ltd.	
Prince George, B.C.	150
Zeidler Forest Industries,	
Edmonton, Alta.	105
Balco Industries Ltd., Kamloops, B.C.	100
St. Croix Pulp & Paper, McAdam, N.B.	100
Kootenay Forest Products,	
Nelson, B.C.	90
Cantree Plywood Corp.,	
New Westminster, B.C.	90
Saskatchewan Forest Products,	
Hudson Bay,	
Sask.	72
Federated Cooperatives Ltd.,	
Canoe, B.C.	64
Victoria Plywood Ltd.,	
Victoria, B.C.	60
Crestbrook Forest Industries	
Ft. McLeod, Alta.	
Normick Inc., Cochrane, Ont.	15
Silvaplex Ltd., Gravenhurst, Ont.	4
Lesage Pianos Ltd.,	
Ste. Therese, Que.	0.3

MDF

Company & plants	Capacity*
Waferboard Corp.,	
Timmins, Ont.	7.2

HARDWOOD PLYWOOD

Company & plants	Capacity*
Weldwood of Canada, Surrey, B.C.	
Newfoundland Hardwoods Ltd.,	
St. Johns, Nfld.	4.5
Levesque Plywood Ltd., Hearst, Ont.	55
Normick Inc., Cochrane, Ont.	50
MacMillan Bloedel, Nipigon, Ont.	35
Vicply Inc., Coboconck, Ont.	25
Canwood Lachute, Orillia, Ont.	7
Curvplywood Products, Orono, Ont.	4
Silvaplex Ltd., Gravenhurst, Ont.	2
Roti Wood Products, Fergus, Ont.	
Commonwealth Plywood Co.,	
Ste. Therese, Que.	72
Normick Inc., LaSarre, Que.	45
Bellerive Veneer & Plywood,	
Mont Laurier, Que.	24
St. Casimir Veneers & Plywood,	
St. Casimir, Que.	12
Les Entreprises V.M.H.,	
Victoriaville, Que.	3
Dominion Shuttle Co., St. Andrews, Que.	
Lesage Pianos Ltd., Ste. Therese, Que.	

HARDBOARD

Company & plants	Capacity*
Masonite Canada Ltd.	
East Point River, N.S.	
Gatineau, Que.	
Canadian Forest Products,	
New Westminster,	
B.C.	180
MacMillan Bloedel Ltd.,	
Sturgeon Falls,	
Ont.	140
Ladysmith Forest Products,	
Ladysmith, B.C.	

INSULATION BOARD

Company & plants	Capacity*
Building Products of Canada	
Point Rouge, Que.	125
Wabamun, Alta.	54
Nordfibre Co., North Bay, Ont.	130
Domtar Construction Materials,	
Donnaconna, Que.	110
Masonite Canada Ltd.,	
Gatineau, Que.	
Stramit Corp. Ltd., Innisfail, Alta.	

* Est. annual capacity (÷000,000)

PARTICLEBOARD

Company & plants	Capacity*
Quebec Hardwoods Inc., Thurso, Ont.	
Sogefor Ltd., Lac des Iles, Que.	60
Pluswood Mfg. Ltd., Atikokan, Ont.	55
MacMillan Bloedel Ltd.,	
Vancouver, B.C.	54
Domtar Construction Materials,	
Huntsville, Ont.	50
Levesque Plywoods Ltd., Hearst, Ont.	50
Rexwood Prod. Ltd., New Liskeard, Ont.	35
Flake Board Co. Ltd., St. Stephen, N.B.	30
Parta Industries Ltd., Grand Forks, B.C.	30
Maillette Lumber Inc., Timmins, Ont.	10
Waferboard Corp., Timmins, Ont.	5

WAFERBOARD

Company & plants	Capacity*
MacMillan Bloedel Ltd.	
Hudson Bay, Sask.	95
Thunder Bay, Ont.	80
Weldwood of Canada Ltd.,	
Longlac, Ont.	100
Slave Lake, Alta.	
Alberta Aspen Board Ltd.,	
Slave Lake,	
Alta.	100
Northwood Pulp & Timber Ltd.,	
Chatham, N.B.	100
Waferboard Corp., Timmins, Ont.	80
Great Lakes Forest Products,	
Thunder Bay, Ont.	76
Normick Perron, LaSarre, Que.	50
Silvaplex Ltd., Gravenhurst, Ont.	

THIN PANELBOARD

Company & plants	Capacity*
Pluswood Manufacturing Ltd.,	
Atikokan, Ont.	200
Flake Board Co. Ltd.,	
St. Stephen, N.B.	45

COMPOSITE PANEL

Company & plants	Capacity*
Domtar Construction Materials,	
Huntsville, Ont.	19.5
Silvaplex Ltd.,	
Gravenhurst, Ont.	1

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MAY 1982

FOREST INDUSTRIES

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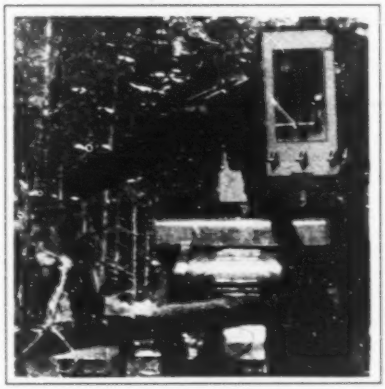
1982 Volume 109 Number 5

MAY

Industry

22
Expand your research and get Uncle Sam to help pay for it

New law provides tax deductions and credits for forest firms that expand research and development efforts



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Sawmill/Panel Clinic drew eager crowds again despite the recession

'Doom and gloom' were far from total as 2,500 people visited FOREST INDUSTRIES' annual show and seminars in Portland. Event is 10 years old

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Formaldehyde emissions got top billing at particleboard symposium

Formaldehyde's famous fumes are getting attention from consumers, regulatory agencies, and the symposium folks in Pullman, Wash.

Woods

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Three-mill complex gets wood from loggers both east and west of border

Georgia-Pacific's Woodland, Maine, mills draw more than 600,000 cords a year from company and other private forests in Maine and New Brunswick

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George Ribelin didn't have enough logging to keep his Flagstaff, Ariz., firm busy, so he started building roads to reach Forest Service timber sales

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Logger keeps a lookout for more efficient ways to get the timber out

Mike Hill of Dierks, Ark., runs a straightforward logging show—with a few differences to ease the work

Mills

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'Upgrade time' comes again to family-owned, progressive sawmill firm

In keeping with its tradition of continual upgrading, Jordan Lumber and Supply has been working on its Mt. Gilead, N.C., mill. Capacity is now higher

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Waferboard plant uses softwoods as raw material

Waferboard is usually a way to make a product from little-used hardwoods, but Georgia-Pacific uses softwoods at its Woodland, Maine, panel plant

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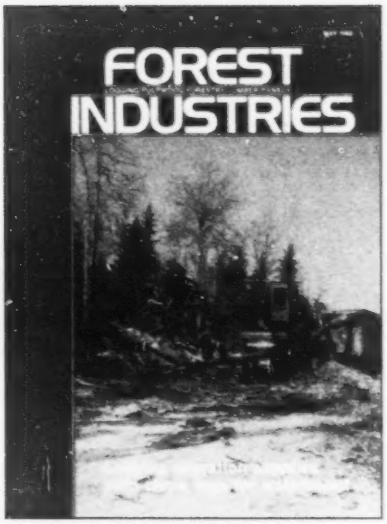

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Wood-fired boiler system cuts fuel costs for New England plating firm

Circle Finishing, an electroplating operation in Massachusetts, installed a G&S heat recovery boiler system after oil bills had climbed to $30,000 a year

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UF-resin emissions headline '82 particleboard symposium

New developments in Com-Ply panels, MDF and process control were on the program, but it was formaldehyde that 300 symposium delegates whiffed most

By PETER OGLE
Associate Editor

PULLMAN, WASH.—Consistant with the chemical nature of formaldehyde, proceedings at the 16th International Particleboard Symposium couldn't escape being permeated by the issue of the ubiquitous and contentious chemical.

With presentation of more than 25 papers on the subject of particleboard and formaldehyde since the symposium series began, no other issue in the industry can rival such continued interest.

The symposium, conducted by the College of Engineering at Washington State University, attracted an audience of approximately 300. Delegates representing the cutting edge of the particleboard industry came to Pullman from 15 countries, noted chairman Thomas M. Maloney.

In addition to formaldehyde emissions, the symposium program also encompassed new developments relating to Com-Ply panels, medium density fiberboard (MDF) and process control. With growing pressure for regulatory controls of exposure to formaldehyde, however, the urgency of the urea formaldehyde (UF) resin issue brought it to the fore.

Regulatory limits on formaldehyde levels for ambient air in workplaces have recently been promulgated in Minnesota, Wisconsin and Texas, observed Kip Howlett, the corporate coordinator for health and safety for Georgia-Pacific Corp. There have been no bans to date on building materials containing formaldehyde, but product standards restricting formaldehyde release are coming, he said.

The Consumer Product Safety Commission banned use of urea formaldehyde foam insulation in February, citing studies showing the product to be potentially carcinogenic. The foam has been used to weatherize an estimated 500,000 to 600,000 homes since 1973.

Formaldehyde, which is emitted into the air from particleboard and other wood-based panel products containing UF glue, is "rapidly becoming caught up in a regulatory whirlwind," Howlett observed. Allowable workplace exposure levels will probably be reduced from levels common a few years ago, he said.

Improved plant ventilation, adjusted resin formulations that result in less free formaldehyde and increased use of alternative binders are three reasons that the sensory irritation caused by formaldehyde inhalation should diminish, the G-P attorney said.

Howlett noted the consensus places irritant level of formaldeyhyde fumes at 1 to 1.25 parts per million (ppm).

In Europe, formaldehyde exposure limits in workroom environments are already in place and are being scaled downward in several countries, according to Birger Sundin, chief engineer with AB Casco of Stockholm, Sweden. In Denmark, for example, the existing ceiling limit of 1.2 mg/m^3 will soon be adjusted to 0.4 mg/m^3 (1 ppm equals 1.25 mg/m^3).

"There is little doubt the suspicions that formaldehyde could be carcinogenic have colored the attitudes of regulatory agencies and trade unions in Europe," Sundin observed. "Calls for a reduction in the permitted safety level may be expected in several countries."

Sundin suspects the coming low exposure limit values in Denmark and Sweden will cause serious economical and technical problems among the users and producers of formaldehyde and formaldehyde-containing products.

Sweden was the first country in the world to introduce proposals for setting an upper limit for the formaldehyde content of air in houses. Denmark, the Netherlands and West Germany soon followed suit with far more rigorous standards. Finland has also recently introduced similar standards, following a series of complaints.

The impact of formaldehyde publicity on particleboard consumption in Europe, however, is by no means uniform, Sundin noted.

"The decline in housing construction and a fall in furniture output preclude the establishment of any direct link between the formaldehyde issue and a decline in sales," he said. "From personal experience, however, I am familiar with several reconstruction projects where property owners have abandoned particleboard in favor of other board materials in anticipation of an odor problem."

There is no surfeit of potential methods to minimize formaldehyde release, Sundin said.

"In this context, we should not lose sight of the scope available to board manufacturers for engineering the manufacturing process to reduce the content of free formaldehyde in the board when using UF resins," the engineer added.

Production parameters which can lower the content of free formaldehyde include: lowest feasible moisture content in unglued, or glued, particles; highest possible pressing temperature; longest possible pressing time; or the use of particle types which give open surfaces.

By optimizing these process engineering parameters, board manufacturers can achieve a substantial reduction in the content of releasable formaldehyde in the board and in the plant, Sundin said.

The formaldehyde debate has created a need for reliable analysis methods and underlines the importance of maintaining quality control of the particleboard production process. While several methods are commonly used to test board emissions in Europe, the two-hour desiccator test has become most widespread in the U.S.

"Controlling variation of emissions from within one 4x8 panel will only help to reduce the board-to-board variation," explained Douglas T. McVey, technical director of particleboard at Willamette Industries. "Full 4x8 panel testing is important; it's the method we use for desiccator sampling."

Programs initiated to reduce formaldehyde emissions have been going on for several years, McVey said, not primarily because of consumer pressure but for worker comfort.

According to test results of a resin manufacturer, a reduction of 68% in formaldehyde emissions by one board producer was achieved between 1971 and 1980, McVey indicated. For those companies not able to take advantage of changes in resin technology, a range of resin "scavengers" can be added to the glue formula to help tie up free formaldehyde, he said.

These scavengers are additives that chemically react with formaldehyde to reduce emissions.

A variety of surface treatments is also available to minimize formaldehyde release. "I've yet to find a coating that was not successful in reducing formaldehyde emissions," McVey said.

These coatings include formaldehyde absorbing paints, lacquers, short-cycle melamine paper, PVC foils and a wax-based hot melt coating.

As an alternative to UF resin, isocyanate has received continued scrutiny by industry researchers. The caul release problem has been overcome and the dangers of toxicity have been dealt with, according to William Johns, associate professor of wood technology at Washington State.

Research by Johns has indicated that a moisture content of 10% in isocyanate-bonded particleboard gives peak values for such properties as elasticity, modulus of rupture and the internal bonding strength.

"We're hearing out of Europe that some suppliers will let you go to 24% moisture content. I'm inclined to believe moisture content that high is doing your board no favor."

Of all physical properties, it is dimensional stability that remains most critical in determining end use of Com-Ply panels. The product has a better core than much plywood produced these days, said retired Washington State professor John Talbot, and in some applications it can replace plywood.

"It's a very stable product. You can jam the edges up next to each other, let it rain on them and they'll perform like plywood," Talbot said.

What's new in pressing?

New pressing technology designed to increase productivity received considerable attention at the symposium, as did developments in particle drying and resin blending of MDF fiber.

A process developed at the Forest Products Laboratory that injects saturated steam into a flakeboard mat during press closure can reduce the time needed to bring the center of the flakeboard to resin-curing temperatures, reported Robert L. Geimer, research technologist at the laboratory.

Total press time for a ½-in., 40 lb/ft³, phenolic-bonded flakeboard, he said, has been reduced by 60% using this process, without degrading internal bond or bending properties.

Various means to reduce press times by injecting steam into the board during some phase of the pressing cycle have been tried. All showed steam injection pressing increased the heat transfer rate, but their commercialization was hampered by the difficulties involved with sealing a large press or the additional expense of incorporating superheaters into the system.

"With the advent of high-cost energy, the potential of steam injection has become more attractive," Geimer said.

Considerable energy savings are also said to be available with a new two-opening press by Pagnoni of Italy.

The press drive system aims at saving energy by using water as a medium in low-pressure air vessels and high-pressure air-loaded hydraulic cylinders, the recharge of which occurs by pumps during board pressing. This system, that can replace a direct pump system, is said by Pagnoni to help reduce power consumption by a third.

"The idea of presenting a press line with two-opening press of great length (36 ft) was justified by the strong need for a valid alternative to the traditional solutions of multi-opening and single-opening presses," said John Hansen, president of Ligna Technology. This press was designed especially for use with radio frequency heating, allowing the system to handle extra-thick MDF mats.

The two-opening press is also adaptable to oriented strand board and waferboard production, Hansen said.

Also on the topic of MDF, a panel of experts debated the merits of blowline blending of resin and MDF fiber. Larry Hammock, production superintendent for Medford Corp., noted that blowline blending was introduced at his company's Medford, Ore., plant to eliminate objectionable "freckling" caused by resin spots on the board surface.

Blowline blending not only gets rid of resin spots, observed Gunner Gran of Sunds Defibrator of Stockholm, Sweden, but requires no special blending equipment, needs no extra space and the blowline nozzle is self-cleaning. An increase in resin consumption, caused by some pre-curing of fibers, is the system's biggest detraction, he said.

"The key to efficient blending is an even flow of materials through blending. If we're going to do a better job of this in the future, we're going to need a measurement system to determine fiber bulk density," Hammock said.

Gunter Bückling, research and development manager at Bison-Werke in West Germany, said his firm thought blowline blending was "a compromise."

"It's clear that better board appearance must be paid for by higher resin use," Bückling noted.

Industry leaders honored

Awards for distinguished service to the industry awards were presented at the symposium to Charles R. Morschauser (posthumous award), technical director of the National Particleboard Assn. for many years, and Hobert O. McQueary, president of Inter-Pacific Resin, Sweet Home, Ore., and chief of research and development at Ellingson Timber Co. in Baker, Ore.

The first inductees into a new Wood Composition Board Hall of Fame, to be maintained at Washington State University, were Dr. Fred Fahrni, Wilhelm H. Klauditz and Clark C. Heritage. ■

TABLE 1—Formaldehyde exposure limits in Western European workplaces

Country	Existing limit (parts/million)	Planned limit (parts/million)
Denmark	0.96	0.32
Finland	2.0	1.0
Norway	1.0	no change
Sweden	1.0	0.5
Holland	2.0	no change
United Kingdom	2.0	no change
Belgium	2.0	no change
West Germany	1.0	no change
Switzerland	1.0	no change
Italy	1.0	no change

Source: AB Casco, Sweden

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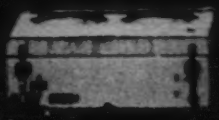
FOREST INDUSTRIES

LOGGING PULPWOOD/FORESTRY LUMBER PANELS



1982 Annual LUMBER REVIEW

A 'bite' of pine logs starts its path to becoming lumber

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Not that it will surprise anyone, but for most North American lumber producers, 1981 was a disastrous year

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'Graveyard picnic' air permeates NFPA meeting
Timber industry support for Reagan's program declines as economic hardship grows, but his followers haven't decided to abandon him

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Sawmill/logging show draws 'quality' crowd
Attendance at East Coast Expo in Richmond, Va., was down 15% this May, but 8,500 came to see the machinery and services exhibits

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Employee training got as much attention as iron for new sawmill's setup
Georgia Kraft's mill in Coosa, Ga., relies on high-tech equipment, of course, but the human side is just as important

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It takes two companies to keep this guy busy
Contract logger Wally Smith of Overgaard, Ariz., runs two separate companies harvesting pine timber for several different timber companies

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Non-surprise news of 1982: a survey of U.S. and Canadian mills shows lumber production continues on its 40-month-old downward slide

One word describes '81's lumber output: disastrous

San Francisco, California

By Herb Lambert

That old cliché about being able to prove anything with figures or statistics falls by the wayside when it comes to reporting 1981's lumber production in any way other than disastrous.

It would be interesting, though not heartening, to be able to include in this report the number of mills (or companies) which have thrown in the towel in the past year, or which have operated at varying rates of production. Such information is not readily available, so this report must stick to the figures alone in looking at the lumber sector of the forest products industry in 1981.

Data presented here reflect, for the major part, production from 400 producers. The final figure, 39.136 billion ft (see table below), also includes combined footage from an assortment of smaller producers below the cutoff level of the 400th company—11 million ft.

Production, as used throughout this Annual Lumber Review, means softwood and hardwood combined.

The total reported for 1981 (39.136 billion ft) compares with 42.634 billion reported in the 1980 survey and 47.147 billion in 1979.

As might be expected, production patterns of many years were not altered in 1981: the West still led in the U.S., and British Columbia production was about 70% of total Canadian output.

The West reported 13.546 billion ft; the South, 9.557 billion; and the North and East, 2.053 billion. This U.S. production, from 1,270 mills, totaled 25.158 ft. In Canada, 309 mills replying produced 13.979 billion ft—with producers outside B.C. accounting for 4.242 billion.

The 25.158 billion ft reported in the survey in the U.S. compares with 29.713 billion ft which the National Forest Products Assn. reported as U.S. production in 1981, and was 84.7% of the national total.

In Canada, the Council of Forest Industries of B.C. and Statistics Canada reported national production of 16.811 billion ft in 1981. The survey total of 13.979 billion represents 83.2% of the total.

As observed earlier, almost anything can be proved with statistics. The comparative figures cited here, and cited for earlier years, prove simply that the industry has suffered severely as housing has ground to a halt.

As noted in last year's version of this annual FOREST INDUSTRIES survey, lumber production began to decline in the fall of 1979 as housing slowed. The decline continued in 1980. It continued in

Lumber production (bd ft), U.S. and Canada — 1981

	UNITED STATES		CANADA		U.S. & CANADA	
Production Range	No. Mills	Production	No. Mills	Production	No. Mills	Production
Over 50MM	89	12,310,708,400	112	10,004,475,795	201	22,315,184,195
25 to 50MM	156	5,505,599,967	76	2,796,516,484	232	8,302,116,451
10 to 25MM	275	4,389,397,395	58	896,631,928	333	5,286,029,323
5 to 10MM	250	1,768,298,625	24	170,341,872	274	1,938,640,497
3 to 5MM	184	702,301,744	19	73,963,521	203	776,265,265
Other	316	481,502,685	20	36,671,605	336	518,174,290
TOTALS	**1,270**	**25,157,808,816**	**309**	**13,978,601,205**	**1,579**	**39,136,410,021**

Lumber production (bd ft), U.S. and Canada — 1980

	UNITED STATES		CANADA		U.S. & CANADA	
Production Range	No. Mills	Production	No. Mills	Production	No. Mills	Production
Over 50MM	115	13,330,385,290	120	11,303,609,380	235	24,633,994,670
25 to 50MM	171	5,987,357,139	72	2,700,075,495	243	8,687,432,634
10 to 25MM	296	4,630,790,980	63	990,621,144	359	5,621,412,124
5 to 10MM	287	1,975,948,669	31	227,842,717	318	2,203,791,386
3 to 5MM	233	889,856,299	16	63,239,405	249	953,095,704
Other	335	499,999,834	18	33,941,529	353	533,941,363
TOTALS	**1,437**	**27,314,338,211**	**320**	**15,319,329,670**	**1,757**	**42,633,667,881**

Leading 400 lumber producers

(Ranked according to data received

1.	Weyerhaeuser Co. (38 mills) Tacoma, Wash.	2,774,000,000
2.	Georgia-Pacific Corp. (42) Portland, Ore. (Atlanta, Ga.)	1,418,629,000
3.	Louisiana-Pacific Corp. (60) Portland, Ore.	1,287,000,000
4.	MacMillan Bloedel Ltd. (10) Vancouver, B.C.	916,655,000
5.	Boise Cascade (21) Boise, Idaho	730,631,000
6.	International Paper Co. (21) Dallas, Texas	719,884,000
7.	Crown Zellerbach (16) San Francisco, Calif.	717,900,000
8.	Canadian Forest Products Ltd. (14) Vancouver, B.C.	649,514,000
9.	Weldwood of Canada Ltd. (10) Vancouver, B.C.	649,218,000
10.	West Fraser Timber Co. Ltd. (6) Quesnel, B.C.	647,913,000
11.	British Columbia Forest Products Ltd. (8) Vancouver, B.C.	627,238,000
12.	St. Regis Paper Co. (12) Tacoma, Wash.	543,800,409
13.	Champion International Corp. (18) Stamford, Conn.	513,497,000
14.	Diamond International (12) Red Bluff, Calif.	476,000,000
15.	Northwood Pulp & Timber Ltd. (4) Prince George, B.C.	470,869,000
16.	B.C. Timber Ltd. (7) Vancouver, B.C.	470,738,000
17.	Simpson Timber Co. (7) Seattle, Wash.	467,914,000
18.	Potlatch Corp. (10) Lewiston, Idaho	451,480,000
19.	Whonnock Industries (7) Vancouver, B.C.	416,170,000
20.	Sierra Pacific Industries (8) Redding, Calif.	386,000,000
21.	Normick-Perron Inc. (6) La Sarre, Que.	302,300,400
22.	Union Camp Corp. (8) Savannah, Ga.	298,972,000
23.	Edward Hines Lumber Co. (10) Chicago, Ill.	291,900,000
24.	Pope & Talbot Inc. (5) Portland, Ore.	291,555,000
25.	Abitibi-Price Lumber Ltd. (6) Toronto, Ont.	290,610,000
26.	Publisher's Paper Co. (4) Lake Oswego, Ore.	287,206,000
27.	Willamette Industries (8) Portland, Ore.	286,880,000
28.	Bohemia Inc. (10) Eugene, Ore.	273,000,000
29.	Doman Industries Ltd. (4) Duncan, B.C.	245,820,000
30.	Kimberly-Clark Corp. (7) Coosa Pines, Ala.	244,013,000
31.	Plum Creek Lumber (6) Columbia Falls, Mont.	243,752,000
32.	Roseburg Lumber Co. (4) Roseburg, Ore.	240,891,000
33.	Coastal Lumber Co. (19) Weldon, N.C.	239,942,000
34.	The Continental Group (9) Savannah, Ga.	222,719,000
35.	Forex Inc. (6) Val d'Or, Que.	216,000,000
36.	Netherlands Overseas Mills (3) Prince George, B.C.	201,000,000
37.	Saucier Forest Products Ltd. (3) Labelle-Quevillon, Que.	200,000,000
38.	Georgia Kraft, Woodkraft Div. (3) Peachtree City, Ga.	195,000,000
39.	Finlay Forest Industries Ltd. (2) Mackenzie, B.C.	193,000,000
40.	Gilman Paper Co. (4) St. Marys, Ga.	190,242,453
41.	J.D. Irving Ltd. (7) St. John, N.B.	180,700,000
42.	Southwest Forest Industries (11) Phoenix, Ariz.	177,615,000
43.	Great Northern Nekoosa Corp. (4) Stamford, Conn.	163,500,000
44.	Slocan Forest Products Ltd. (2) Richmond, B.C.	158,873,000
45.	Tahsis Co. Ltd. (1) Vancouver, B.C.	158,819,000
46.	Crestbrook Forest Industries (3) Cranbrook, B.C.	155,639,000
47.	Swanson Lumber Co. (3) Edmonton, Alta.	151,923,000
48.	Evans Products Co. (4) Portland, Ore.	147,988,000
49.	American Forest Products Co. (4) San Francisco, Calif.	146,799,000
50.	Eurocan Pulp & Paper Co. (2) Kitimat, B.C.	146,000,000

1981. And it continued in the first half of 1982. The downslide is dramatic.

Two sets of data which traditionally have generated the most questions to the editors are the "relative rankings" of the Top 25 producers replying to our survey, and the list of Top 100 producers in North America.

In the chart of relative rankings (see p. 22), please note that B.C. Timber, number 16 in 1981, formerly was called Canadian Cellulose. The company has consistently been counted among North America's top 25 lumber producers.

For the Top 100 producers, comparative data are shown for 1981 and the preceding nine years. In 1981, these producers accounted for 29.956 billion bd ft and listed 657 mills as their producing units. As can be seen from the table on p. 21, one must go back to 1976 to find the next lowest total—when it was 27.978 billion ft. The next lowest "cutoff" volume for the 100th producer is found in 1973, when it was 72 million, compared with 74.580 in 1981. The lowest shown was 56.5 million, the cutoff volume in 1975.

Inasmuch as 1982 now is half gone, there is little likelihood that final production figures for this year will differ much from those of 1981. They could, in fact, finally show somewhat less volume than in 1981, although one hopes that will not happen. Some upturn could begin before this summer wanes.

Any mention of an upturn in housing and, consequently, an upturn in building materials production—lumber, plus plywood, panels and other items—must also consider a potential marketplace squeeze. As production struggles to meet demand, in a vigorous market, the squeeze will be felt and, with it, perhaps there will be an outpouring of criticism of the producers—or the industry. As mills push to meet demand (perhaps, and we hope, sometime in 1983) there may be yet another "scandal" about the costs of building materials.

If history's pattern is repeated, the basic economic lesson of supply and demand will be ignored and there could be cries for "investigation" of the industry.

If the observation may be allowed, here and now, the government and the "investigators" can save considerable time and money simply by referring to the records of past hearings and investigations . . . period. ■

— United States and Canada

by FOREST INDUSTRIES by June 2, 1982)

51.	The Pas Lumber Co. (1) Prince George, B.C.	145,730,383
52.	Mountain Fir Lumber Co. Inc. (4) Salem, Ore.	140,863,000
53.	Pinette & Therrien Mills Ltd. (2) Williams Lake, B.C.	139,092,000
54.	Pacific Lumber Co. (3) San Francisco, Calif.	138,045,500
55.	Willamina Lumber Co. (3) Portland, Ore.	133,600,000
56.	Tolko Industries Ltd. (2) Vernon, B.C.	131,600,000
57.	Eel River Sawmills Inc. (3) Fortuna, Calif.	127,967,000
58.	White Swan Lumber Co. Inc. (4) White Swan, Wash.	120,672,237
59.	Wickes Forest Industries (5) Dinuba, Calif.	119,951,000
60.	Les Materiaux Blanchet Inc. (3) St. Pamphile, Que.	115,500,000
61.	Ainsworth Lumber Co. Ltd. (3) 100 Mile House, B.C.	115,000,000
62.	Rustad Bros. & Co. Ltd. (1) Prince George, B.C.	113,000,000
63.	Hammermill Paper Co. (16) Selma, Ala.	112,220,824
64.	Duke City Lumber Co. (7) Albuquerque, N.M.	112,023,500
65.	Domtar Forest Products Group (4) Montreal, Que.	112,000,000
66.	Cipa Industries Ltd. (2) Vancouver, B.C.	110,483,000
67.	Kirby Forest Industries Inc. (3) Houston, Texas	110,081,683
68.	Lignum Ltd. (2) Vancouver, B.C.	109,681,000
69.	Summit Timber Co. (1) Everett, Wash.	106,307,953
70.	Federated Cooperatives Ltd. (2) Canoe, B.C.	106,000,000
71.	Medford Corp. (2) Medford, Ore.	105,305,000
72.	Revelstoke Companies Ltd. (5) Calgary, Alta.	102,814,268
73.	ITT Rayonier Inc. (16) Stamford, Conn.	102,619,000
74.	Arcata Redwood Co. (2) Arcata, Calif.	102,540,000
75.	Donohue St-Felicien Inc. (3) Quebec, Que.	99,532,000
76.	Jacobson Bros. Forest Products (1) Williams Lake, B.C.	99,492,097
77.	Pacific Lumber & Shipping Co. (3) Seattle, Wash.	99,074,226
78.	Idaho Forest Industries (3) Coeur d'Alene, Idaho	98,542,000
79.	Temple-Eastex Inc. (2) Diboll, Texas	98,224,000
80.	Owens-Illinois Inc. (3) Toledo, Ohio	98,168,000
81.	RSG Forest Products (1) Kalama, Wash.	98,076,942
82.	Stimson Lumber Co. (2) Portland, Ore.	97,848,961
83.	Consolidated-Bathurst Inc. (5) Montreal, Que.	90,382,606
84.	S&R Sawmills Ltd. (3) Surrey, B.C.	87,000,000
85.	Scott Paper Co. (6) Philadelphia, Pa.	85,497,000
86.	Bennett Lumber Products Inc. (2) Princeton, Idaho	85,446,054
87.	P&M Lumber Products Inc. (4) Stockton, Calif.	85,167,000
88.	Fort Nelson Forest Ind. Ltd. (1) Fort Nelson, B.C.	84,830,000
89.	Harwood Products (2) Willits, Calif.	84,365,736
90.	Levesque Lumber (Hearst) Ltd. (1) Hearst, Ont.	84,283,000
91.	Carrier Lumber Ltd. (1) Prince George, B.C.	79,931,340
92.	Collins Pine Co. (2) Portland, Ore.	79,070,432
93.	E.B. Eddy Forest Products Ltd. (3) Ottawa, Ont.	78,291,000
94.	American Timber Co. (1) Olney, Mont.	78,139,515
95.	Avison Lumber Co. (1) Molalla, Ore.	77,194,000
96.	Drew Sawmills Ltd. (1) Malakwa, B.C.	76,000,000
97.	Balfour Guthrie Canada Ltd. (1) Prince George, B.C.	75,700,000
98.	American Can Co. (3) Greenwich, Conn.	75,248,000
99.	F.H. Stoltze Land & Lumber Co. (3) Columbia Falls, Mont.	75,112,509
100.	Manville Forest Products Corp. (3) West Monroe, La.	74,580,322

Comparative data — Top 100 companies — 1972-1981

(Millions of bd ft)
(U.S. and Canadian companies)

Calendar year	Total volume reported in the survey	Total volume reported by Top 100 Co.'s	Number mills in Top 100	Total volume by year's top producer	Cutoff volume of year's 100th producer	Co.'s producing more than one billion bd ft
1981	39,136	26,956	657	2,744	74.580	3
1980	42,633	28,037	641	2,889	80.000	4
1979	47,699	31,599	634	2,955	91.300	4
1978	49,268	32,142	629	2,662	90.634	5
1977	46,256	30,988	645	2,806	85.282	5
1976	41,330	27,978	639	2,702	77.333	4
1975	33,100	22,023	633	2,530	56.500	2
1974	37,869	24,652	589	2,541	65.470	3
1973	39,443	26,334	547	2,405	72.000	4
1972	38,840	24,922	483	2,392	71.295	3

Leading North American producers

101.	Zeidler Forest Industries Ltd. (3) Edmonton, Alta.	74,289,000	
102.	Fraser Inc. (2) Edmunston, N.B.	73,870,000	
103.	Kaibab Industries (4) Phoenix, Ariz.	72,658,945	
104.	Burrill Lumber Co. (1) Medford, Ore.	72,312,000	
105.	Shell Canada Resources Ltd. (1) Calgary, Alta.	72,235,000	
106.	Federal Paper Board Co. Inc. (2) Riegelwood, N.C.	72,000,000	
107.	Manke Lumber Co. Inc. (2) Tacoma, Wash.	71,516,528	
108.	TMA Forest Products (5) Jasper, Alta.	71,116,000	
109.	Joe N. Miles & Sons (3) Lumberton, Miss.	71,000,000	
110.	Dant & Russell Inc. (2) Portland, Ore.	70,854,750	
111.	Gregory Industries Ltd. (3) Delta, B.C.	70,000,000	
112.	Bowater North American Corp. (2) Greenville, S.C.	69,251,000	
113.	Rosboro Lumber Co. (1) Springfield, Ore.	68,704,000	
114.	La Scierie Taschereau Inc. (2) Taschereau, Que.	67,000,000	
115.	G.W. Martin Lumber Ltd. (5) Harcourt, Ont.	66,030,000	
116.	North Pacific Lumber Co. Inc. (2) Portland, Ore.	65,074,000	
117.	Buchanan Hardwoods Inc. (4) Selma, Ala.	65,000,000	
118.	Crete & Fils Inc., Gerard (2) Proulxville, Que.	65,000,000	
119.	Apollo Forest Products Ltd. (1) Fort St. James, B.C.	64,403,851	
120.	Lakeland Mills Ltd. (1) Prince George, B.C.	64,000,000	
121.	Scotch Lumber Co. (3) Fulton, Ala.	62,009,650	
122.	SDS Lumber Co. (3) Bingen, Wash.	62,009,650	
123.	Sun Studs Inc. (1) Roseburg, Ore.	62,000,000	
124.	Anderson-Tully (3) Memphis, Tenn.	61,464,844	
125.	Koppers Co. Inc. (21) Pittsburgh, Pa.	61,068,000	
126.	L&K Lumber (North Shore) Ltd. (1) North Vancouver, B.C.	60,736,190	
127.	Mayr Bros. Lumber Co. (2) Hoquiam, Wash.	60,000,000	
128.	McNamara & Peepe Lumber (2) Crescent City, Calif.	59,661,636	
129.	Maibec Industries Inc. (2) Ste. Foy, Que.	59,625,000	
130.	Great West Timber Ltd. (1) Thunder Bay, Ont.	58,000,000	
131.	Mackenzie Forest Products Inc. (1) Hudson, Ont.	56,700,000	
132.	North Side Lumber (1) Philomath, Ore.	56,500,000	
133.	Sask. Forest Products Corp. (2) Prince Albert, Sask.	56,200,000	
134.	Allied Forest Products Inc. (3) Portland, Ore.	55,302,000	
135.	Boyd Lumber Corp. (2) Sedro Woolley, Wash.	55,000,000	
136.	Sciere St. Michel Inc. (2) St. Michel, Que.	55,000,000	

Relative rankings

(Based on companies responding in each of the years. Figures in parentheses indicate ranking outside the 25 places which this list represents.)

Company	'81	'80	'79
Weyerhaeuser	1	1	1
Georgia-Pacific	2	3	3
Louisiana-Pacific	3	2	2
MacMillan Bloedel	4	4	4
Boise Cascade	5	9	8
International Paper	6	10	14
Crown Zellerbach	7	5	6
Canadian Forest Products	8	7	5
Weldwood Canada	9	8	9
West Fraser Timber	10	11	12
B. C. Forest Industries	11	6	7
St. Regis	12	16	15
Champion International	13	14	10
Diamond International	14	17	20
Northwood Pulp & Timber	15	13	13
B.C. Timber*	16	20	(27)
Simpson Timber	17	12	16
Potlatch Corp.	18	15	11
Whonnock Industries	19	18	19
Sierra Pacific Industries	20	19	18
Normick-Perron	21	22	25
Union Camp	22	(27)	(32)
Edward Hines	23	(29)	(28)
Pope & Talbot	24	(28)	23
Abitibi-Price	25	(34)	(34)

*In '80 and '79, Canadian Cellulose

Lumber production (bd ft)

Production Range	WEST No. Mills	WEST Production	SOUTH No. Mills	SOUTH Production
Over 50MM	65	7,612,908,972	20	4,303,211,481
25 to 50MM	95	3,403,009,833	56	1,949,854,366
10 to 25MM	124	2,085,824,053	122	1,892,989,863
5 to 10MM	44	321,895,321	132	935,502,858
3 to 5MM	14	51,672,538	82	320,331,763
Other	58	71,680,863	103	155,407,373
TOTALS	**400**	**13,546,991,579**	**515**	**9,557,297,704**

Lumber production (bd ft)

Production Range	WEST No. Mills	WEST Production	SOUTH No. Mills	SOUTH Production
Over 50MM	85	8,848,781,392	26	4,058,466,486
25 to 50MM	105	3,658,264,209	60	2,110,391,830
10 to 25MM	116	1,933,534,224	145	2,216,183,621
5 to 10MM	50	361,426,729	155	1,064,970,831
3 to 5MM	32	120,359,669	110	423,929,360
Other	56	62,161,634	106	170,728,826
TOTALS	**444**	**14,984,527,857**	**602**	**10,044,670,954**

137.	Gregory Timber Resources Inc. (2) Glendale, Ore.	54,933,000	
138.	Anthony Timberlands Inc. (5) Bearden, Ark.	54,805,000	
139.	Langdale Co. (1) Valdosta, Ga.	54,762,986	
140.	Malette Lumber Inc. (1) Timmins, Ont.	54,000,000	
141.	Manitoba Forest Resources Ltd. (1) The Pas, Man.	53,398,192	
142.	Memphis Hardwood Flooring (4) Memphis, Tenn.	53,000,000	
143.	L&M Lumber Ltd. (1) Vanderhoof, B.C.	52,897,799	
144.	Brazier Forest Products Inc. (1) Molalla, Ore.	52,778,000	
145.	Spruce Falls Pwr. & Paper Co. (1) Kapuskasing, Ont.	52,500,000	
146.	Warm Springs Forest Products Inc. (1) Warm Springs, Ore.	52,358,126	
147.	Raven Lumber Ltd. (1) Campbell River, B.C.	52,135,000	
148.	United Sawmill Ltd. (3) Hearst, Ont.	51,614,827	
149.	Davidson Industries (2) Mapleton, Ore.	51,587,000	
150.	New South Forest Industries (2) Conway, S.C.	51,560,000	
151.	Modoc Lumber Co. (1) Klamath Falls, Ore.	50,370,369	
152.	Dubreuil Bros. Ltd. (1) Dubreuilville, Que.	50,269,826	
153.	Douglas County Lumber Co. (1) Roseburg, Ore.	50,000,000	
154.	Gulf Lumber Co. (1) Mobile, Ala.	50,000,000	
155.	Greenwood Forest Products Ltd. (1) Penticton, B.C.	50,000,000	
156.	Bisson & Bisson (1) Matagami, Que.	49,646,172	
157.	Michigan California Lumber (1) Camino, Calif.	49,418,000	
158.	Del-Cook Lumber Co. (1) Adel, Ga.	49,016,172	
159.	Ellingson Lumber Co. (1) Baker, Ore.	48,386,000	
160.	Elk Lake Planing Mill (2) Elk Lake, Ont.	48,000,000	
161.	Hudson Lumber (2) Anderson, Calif.	47,729,060	
162.	Groot Logging Ltd. (1) Smithers, B.C.	46,543,000	
163.	Spalding & Son Inc. (1) Grants Pass, Ore.	46,400,000	
164.	Webster Lumber Co. (9) Wayzata, Minn.	46,200,000	
165.	Pacific Forest Products Ltd. (2) Victoria, B.C.	45,580,000	
166.	Nechako Lumber Ltd. (1) Vanderhoof, B.C.	45,488,613	
167.	Bond Bros. Sawmill (1) Vanderhoof, B.C.	45,107,536	
168.	Merrill & Ring Inc. (1) Port Angeles, Wash.	45,036,022	
169.	Olympic Forest Products (1) Mist, Ore.	45,000,000	
170.	Connor Forest Industries (6) Wausau, Wis.	44,420,000	
171.	Alaska Lumber & Pulp Co. Inc. (2) Wrangell, Alaska	44,365,679	
172.	Oregon Cedar Products Co. (1) Springfield, Ore.	44,000,000	

by regions — 1981

Production Range	NORTH & EAST No. Mills	NORTH & EAST Production	BRITISH COLUMBIA No. Mills	BRITISH COLUMBIA Production	OTHER CANADIAN No. Mills	OTHER CANADIAN Production
Over 50MM	4	394,587,947	89	8,258,039,143	23	1,746,436,652
25 to 50MM	5	152,735,768	31	1,191,660,614	45	1,604,855,870
10 to 25MM	29	410,583,479	17	249,914,214	41	646,717,714
5 to 10MM	74	510,900,447	2	13,581,000	22	156,760,872
3 to 5MM	88	330,297,443	4	13,321,000	15	60,642,521
Other	155	254,414,449	6	9,841,098	14	26,830,507
TOTALS	**355**	**2,053,519,533**	**149**	**9,736,357,069**	**160**	**4,242,244,136**

by regions — 1980

Production Range	NORTH & EAST No. Mills	NORTH & EAST Production	BRITISH COLUMBIA No. Mills	BRITISH COLUMBIA Production	OTHER CANADIAN No. Mills	OTHER CANADIAN Production
Over 50MM	4	423,137,412	93	9,434,943,314	27	1,868,666,066
25 to 50MM	6	218,701,100	29	1,065,419,869	43	1,634,655,626
10 to 25MM	35	481,073,135	16	237,529,078	47	753,092,066
5 to 10MM	82	549,551,109	4	30,676,000	27	197,166,717
3 to 5MM	91	345,567,270	3	11,526,000	13	51,713,405
Other	173	267,109,374	5	9,631,343	13	24,310,186
TOTALS	**391**	**2,285,139,400**	**150**	**10,789,725,604**	**170**	**4,529,604,066**

Leading North American producers

173.	Scierie Des Outardes, (1) Hauterive, Que.	44,000,000
174.	Navajo Forest Products Ind. (1) Navajo, N.M.	43,358,217
175.	Brand-S Corp. (1) Corvallis, Ore.	42,851,000
176.	Wetsel-Oviatt Lumber Co. (1) Shingle Springs, Calif.	42,314,560
177.	Harrigan Lumber Co. Inc. (1) Monroeville, Ala.	41,248,280
178.	Delson Lumber Co. (1) Olympia, Wash.	41,000,000
179.	Tolleson Lumber Co. Inc. (3) Perry, Ga.	41,000,000
180.	Vanport Manufacturing Co. (3) Boring, Ore.	40,617,944
181.	Hanel Lumber Co. (1) Hood River, Ore.	40,355,723
182.	Poulin & Pouliot Ltee. (1) St. Camille Bellechasse, Que.	40,000,000
183.	Buse Timber & Sales Inc. (1) Marysville, Wash.	39,927,000
184.	J.P. Hamer Lumber Co. (6) Kenova, W. Va.	39,907,000
185.	Gilchrist Timber Co. (1) Gilchrist, Ore.	39,800,000
186.	Raoul Guerette Inc. (2) Degelis, Que.	39,320,000
187.	Mill & Timber Products (1) Surrey, B.C.	38,852,000
188.	W-I Forest Products Inc. (2) Wilsonville, Ore.	38,553,000
189.	Nova Lumber Co. Ltd. (1) West Vancouver, B.C.	38,435,000
190.	Schmidbauer Lumber Inc. (1) Eureka, Calif.	38,215,155
191.	Snider Industries (1) Marshall, Texas	38,000,000
192.	Gorman Bros. Lumber & Box (1) Westbank, B.C.	38,000,000
193.	Scierie Landrienne Inc. (1) Landrienne, Que.	38,000,000
194.	Chesapeake Corp. of Virginia (4) West Point, Va.	37,550,000
195.	Evergreen Lumber Co. (4) Snowflake, Ariz.	37,000,000
196.	Hankins Lumber Co. Inc. (2) Grenada, Miss.	36,776,091
197.	Balfour Lumber Co. (1) Thomasville, Ga.	36,573,000
198.	Sierra Forest Products (1) Terra Bella, Calif.	36,350,000
199.	Dean-Dempsey Lumber Co. (2) Orangeburg, S.C.	35,501,700
200.	AT&N Lumber Service Inc. (3) York, Ala.	35,500,000
201.	Pinecrest Lumber Co. (1) Plumerville, Ark.	35,000,000
202.	Sheppard Lumber Co. Inc., W. (1) Brooklet, Ga.	35,000,000
203.	Murray Bros. Lumber Ltd. (1) Madawaska, Ont.	35,000,000
204.	Decker Lake Forest Products (1) Burns Lake, B.C.	35,000,000
205.	Friesen Lumber Co. (1) St. Helens, Ore.	34,000,000
206.	Welco Lumber Co. (2) Marysville, Wash.	33,951,538
207.	Erickson Lumber Co. (1) Marysville, Calif.	33,677,140
208.	Z Mills (1) Eugene, Ore.	33,500,000
209.	Charles Ingram Lumber Co. (1) Florence, S.C.	33,357,000
210.	Molpus Lumber Co. (3) Philadelphia, Miss.	33,039,000
211.	Hemphill-O'Neill Lumber Co. Inc. (1) Chehalis, Wash.	33,000,000
212.	J&J Logging & Lumber Corp. (3) Dover Plains, N.Y.	33,000,000
213.	Buchanan Lumber Ltd. (1) High Prairie, Alta.	32,387,000
214.	D.R. Johnson Lumber Co. (1) Riddle, Ore.	32,359,000
215.	Griffin Lumber Co. (3) Cordele, Ga.	32,170,000
216.	Guy Bennett Lumber Co. (1) Clarkston, Wash.	32,127,108
217.	Fremont Sawmill Co. (1) Lakeview, Ore.	32,000,000
218.	Newaygo Forest Products Ltd. (1) Hearst, Ont.	32,000,000
219.	Moore Mill & Lumber Co. (2) Bandon, Ore.	31,758,403
220.	Seaboard Lumber Co. (1) Seattle, Wash.	31,518,405
221.	Ochoco Lumber Co. (1) Prineville, Ore.	31,053,000
222.	Keadle Lumber Enterprises Jnc. (2) Thomaston, Ga.	30,751,727
223.	Aspen Planers Ltd. (1) Merritt, B.C.	30,600,000
224.	Snider Lumber Products (2) Turlock, Calif.	30,483,655
225.	Anthony Forest Products Co. (4) El Dorado, Ark.	30,000,000
226.	Loper Lumber Co. Inc. (3) Tuscaloosa, Ala.	30,000,000
227.	Nagel Lumber Co. Inc. (1) Land O'Lakes, Wis.	30,000,000
228.	T.R. Miller Mill Co. Inc. (1) Brewton, Ala.	30,000,000
229.	West Coast Lumber Operations (1) Tacoma, Wash.	29,999,000
230.	Thompson Hardwoods Inc. (2) Hazlehurst, Ga.	29,873,000
231.	Westvaco Lumber (1) Summerville, S.C.	29,078,600
232.	Juniper Lumber Co. Ltd. (2) Juniper, N.B.	28,989,000
233.	North Anson Reel Co. (1) North Anson, Maine	28,735,768
234.	Lulumco Inc. (1) Luceville, Que.	28,621,098
235.	Cone Lumber Co. (1) Goshen, Ore.	28,224,000
236.	Weier's Sawmill Ltd. (1) Quesnel, B.C.	28,000,000
237.	Marcel Lauzon Inc. (1) East Hereford, Que.	27,036,880
238.	Pyramid Mountain Lumber (1) Seeley Lake, Mont.	27,000,000
239.	H.V. & T.G. Thompson Lumber (1) Ailey, Ga.	26,989,000
240.	Layman Lumber Co. (1) Naches, Wash.	26,962,000
241.	Prairie Wood Products (1) Riddle, Ore.	26,827,000
242.	Gray Lumber Co. (1) Waverly, Va.	26,782,634
243.	Gram Lumber Co. (1) Kalama, Wash.	26,583,055
244.	Hi-Ridge Lumber Co. (1) Yreka, Calif.	26,424,000
245.	Chasse Inc. (1) Ste.-Marie Beauce, Que.	26,302,895
246.	Deltic Farm & Timber Co. Inc. (2) El Dorado, Ark.	26,094,000
247.	Jordan Lumber & Supply (1) Mt. Gilead, N.C.	26,000,000
248.	Johnston & Rhodes Bluestone (1) East Branch, N.Y.	26,000,000
249.	Arkansas Oak Flooring Co. (2) Pine Bluff, Ark.	25,934,000
250.	LaCroix Lumber Ltd. (2) Charlton, Que.	25,613,500

251.	C&D Lumber Co. (1) Riddle, Ore.	25,505,552
252.	Hutchins Lumber Inc. (2) Weippe, Idaho	25,301,138
253.	Shuqualak Lumber Co. Inc. (1) Shuqualak, Miss.	25,172,000
254.	Inter-State Lumber Co. Inc. (2) Kingwood, N.Y.	25,000,000
255.	East Brainerd Lumber Co. Inc. (1) Chattanooga, Tenn.	25,000,000
256.	A.L. Lafreniere Lumber (1) Chapeau, Ont.	25,000,000
257.	Cleveland-Cliffs Iron Co. (1) Cleveland, Ohio	24,616,000
258.	Castle Mountain Corp. (1) White Sulphur Springs, Mont.	24,310,000
259.	DG Shelter Products, Klamath Div. (1) Klamath Falls, Ore.	24,258,000
260.	Kamiah Mills (1) Kamiah, Idaho	24,219,000
261.	Ramsey Lumber Co. (2) Suffolk, Va.	24,016,066
262.	C.M. Tucker Lumber (1) Pageland, S.C.	24,000,000
263.	Roper Bros. Lumber Co. (1) Petersburg, Va.	24,000,000
264.	Pine Products Corp. (1) Prineville, Ore.	24,000,000
265.	Averitt Lumber Co. (3) Clarksville, Tenn.	23,312,000
266.	Caffall Bros. Forest Products (2) Wilsonville, Ore.	23,260,000
267.	Rogge Lumber Inc. (1) Wallowa, Ore.	23,201,646
268.	M.C. Dixon Lumber Co. Inc. (1) Eufaula, Ala.	22,955,737
269.	Martin Timber Co. Inc. (1) Castor, La.	22,782,000
270.	McCully & Soy Ltd. (2) Truro, N.S.	22,627,668
271.	Rajala Lumber Co. (2) Deer River, Minn.	22,500,000
272.	Galloway Lumber Co. (1) Galloway, S.C.	22,500,000
273.	Superior Lumber Co. (1) Glendale, Ore.	22,210,442
274.	Bates Lumber Co. (1) Hot Springs, Ark.	22,168,295
275.	Butler Lumber Co. Inc. (4) Chase City, Va.	22,000,000
276.	P.E. Barnes Lumber (5) Hamburg, Ark.	22,000,000
277.	Delta Cedar Products (1) North Delta, B.C.	22,000,000
278.	J.E. Martel & Sons Lumber (1) Chapleau, Ont.	22,000,000
279.	Allen Logging Co. (2) Forks, Wash.	21,656,601
280.	Wade Wood Inc. (1) Wade, N.C.	21,548,000
281.	Columbus Lumber Co. (1) Brookhaven, Miss.	21,500,00
282.	Broughton Lumber Co. (1) Underwood, Wash.	21,500,000
283.	E.B. Yancey Lumber Co. (1) Madera, Calif.	21,268,000
284.	Tangfeldt Wood Products Co. (1) Eugene, Ore.	21,042,000
285.	Williams Lumber Co. Inc. (1) Rocky Mount, N.C.	21,000,000
286.	Pine Mountain Lumber Co. (1) Yreka, Calif.	21,000,000
287.	Harris Pine Mills (1) Pendleton, Ore.	21,000,000
288.	Kitwanga Lumber Co. (1) Kitwanga, B.C.	21,000,000
289.	Cedar Lumber Inc. (1) Mill City, Ore.	20,557,000
290.	Lake Region Lumber Co. (1) Casco, Maine	20,355,428
291.	Crane Mills (1) Corning, Calif.	20,307,000
292.	Cambria Forest Industries Inc. (1) Newcastle, Wyo.	20,300,000
293.	Merritt Bros. Lumber Co. Inc. (1) Priest River, Idaho	20,000,000
294.	W.W. Lumber Co. (1) Cottage Grove, Ore.	20,000,000
295.	Mebane Lumber Co. Inc. (1) Mebane, N.C.	20,000,000
296.	Calandor Pine Corp. (1) Alturas, Calif.	20,000,000
297.	Potomac Supply Corp. (1) Kinsale, Va.	20,000,000
298.	Hinchcliff Products Co. (2) Strongsville, Ohio	20,000,000
299.	Chiloquin Forest Products (1) Chiloquin, Ore.	20,000,000
300.	Stayton Wood Products Inc. (1) Stayton, Ore.	20,000,000
301.	Paul Bunyan Lumber Co. (1) Anderson, Calif.	19,990,000
302.	Big Valley Lumber Co. (1) Bieber, Calif.	19,827,000
303.	Kelly Enterprises Inc. (7) Pittsfield, Mass.	19,550,000
304.	Keller Lumber Co. (1) Roseburg, Ore.	19,048,000
305.	Quebec Hardwoods Inc. (1) Thurbo, Que.	18,800,000
306.	Evergreen Forest Products Inc. (1) New Meadows, Idaho	18,694,415
307.	St. Johns Forest Products Co. (1) Portland, Ore.	18,687,620
308.	Consolidated Pine Inc. (1) Prineville, Ore.	18,652,500
309.	Wells Inc. (1) Sharptown, Md.	18,363,000
310.	Kimball International Inc. (4) Jasper, Ind.	18,220,437
311.	Zip-O-Log Mills Inc. (1) Eugene, Ore.	18,000,000
312.	Copiah County Manufacturing (1) Hazlehurst, Miss.	18,000,000
313.	A.J.D. Forest Products Inc. (1) Grayling, Mich.	18,000,000
314.	Taylor Lumber Co. (1) Beaverton, Ore.	17,999,557
315.	H.G. Toller & Son Lumber Co. (1) Leola, Ark.	17,918,637
316.	Menominee Tribal Enterprises (1) Neopit, Wis.	17,663,778
317.	Custer Lumber Co. (1) Custer, S.D.	17,517,000
318.	Wood Reels Inc. (1) Hartselle, Ala.	17,500,000
319.	Alton Packaging Corp. (1) Alton, Ill.	17,456,822
320.	Owens & Hurst Lumber (1) Eureka, Mont.	17,452,000
321.	T.J. Moss Lumber Co. (3) Rodgersville, Ala.	17,415,000
322.	McShan Lumber Co. Inc. (1) McShan, Ala.	17,000,000
323.	Culp Lumber Co. (1) New London, N.C.	17,000,000
324.	Semac Industries (3) Millersburg, Ohio	16,975,000
325.	Greensboro Lumber Co. (2) Greensboro, Ga.	16,805,775
326.	Paxport Mills Inc. (1) Tacoma, Wash.	16,631,000
327.	Gosselin Lumber Co. (1) Hearst, Ont.	16,500,000
328.	Doyle Lumber Inc. (1) Martinsville, Va.	16,340,000

Leading North American producers

329. Lampert Lumber Co. (2) St. Paul, Minn. — 16,204,000
330. Seattle-Snohomish Mill Co. Inc. (1) Snohomish, Wash. — 16,000,000
331. Dickert Lumber Co. (3) Newberry, S.C. — 16,000,000
332. Cersosimo Lumber Co. (3) Brattleboro, Vt. — 16,000,000
333. Abell Lumber Corp. (1) Lawrenceville, Va. — 16,000,000
334. Western Constr. & Lumber Co. Ltd. (1) Edmonton, Alta. — 16,000,000
335. Spray Lake Sawmills Ltd. (1) Cochrane, Alta. — 15,673,608
336. Schnabel Lumber Co. (1) Haines, Alaska — 15,575,800
337. Lakeview Lumber Products (1) Lakeview, Ore. — 15,488,262
338. Mitkof Lumber Products (1) Petersburg, Alaska — 15,218,005
339. Beadles Lumber Co. (1) Mountrie, Ga. — 15,100,000
340. Kitchens Bros. Mfg. (2) Utica, Miss. — 15,026,662
341. Hull-Oakes Lumber (1) Monroe, Ore. — 15,000,000
342. Forest Products Inc. (1) Corbin, Ky. — 15,000,000
343. Varn Wood Products (1) Hoboken, Ga. — 15,000,000
344. Flodin Lumber & Mfg. Co. (1) Plains, Mont. — 14,894,000
345. United Timber Corp. (3) Dixfield, Maine — 14,500,000
346. Neiman Sawmill (1) Hulett, Wyo. — 14,440,000
347. Lausmann Lumber & Mldg. (1) Loomis, Calif. — 14,000,000
348. Tigerton Lumber Co. (4) Tigerton, Wis. — 14,000,000
349. Pacific Studs Inc. (1) Cimarron, N.M. — 14,000,000
350. Collum's Lumber Mill Inc. (1) Allendale, S.C. — 14,000,000
351. Ocala Lumber Sales Co. (1) Ocala, Fla. — 14,000,000
352. Conrad Pouiin & Fils Ltee. (1) Lac Frontiere, Que. — 14,000,000
353. Marys River Lumber Co. Inc. (1) Corvallis, Ore. — 13,950,000
354. Vitale Lumber Co. Inc. (1) Hancock, N.Y. — 13,882,442
355. Spruce Products Ltd. (2) Winnipeg, Man. — 13,800,000
356. William Milne & Sons Ltd. (1) Temagami, Ont. — 13,749,000
357. Herbert Lumber Co. (1) Riddle, Ore. — 13,652,000
358. Johnson Bros. Lumber (1) Silverton, Ore. — 13,646,019
359. Fiest Hardwoods (1) Newton Falls, Ohio — 13,583,150
360. Hamel Forest Products (1) Vesper, Wis. — 13,500,000
361. McRae Lumber Co.Ltd. (1) Whitney, Ont. — 13,360,000
362. Moose River Lumber Co. Inc. (1) Jackman, Maine — 13,348,681
363. Sam Mabry Lumber Co. Inc. (1) Liberty, Miss. — 13,348,023
364. Sundance Lumber Co. Inc. (1) Springfield, Ore. — 13,319,075
365. Sagebrush Sales Co. (2) Montrose, Colo. — 13,241,441
366. Salmon River Lumber Co. (1) Riggins, Idaho — 13,131,614
367. Cuddeback Lumber Co. (1) Eugene, Ore. — 13,000,000
368. Augusta Lumber & Supply Co. (3) Staunton, Va. — 13,000,000
369. Flippo Lumber Corp. (1) Doswell, Va. — 12,860,699
370. Cascade Locks Lumber Co. (1) Cascade Locks, Ore. — 12,870,000
371. Corley & Sons Sawmill Inc. (1) Lexington, S.C. — 12,832,000
372. Trammell Lumber Co. (1) La Grange, Ga. — 12,807,203
373. Bear Paw Timber Corp. (4) Fryeburg, Maine — 12,760,000
374. Indiana Wood Products Inc. (2) Middlebury, Ind. — 12,584,761
375. Sonoma Pacific Co. (1) Oakland, Calif. — 12,429,000
376. Fleming Lumber Co. (1) Crestview, Fla. — 12,400,000
377. Great Western Lumber Co. (1) Everson, Wash. — 12,350,000
378. Coos Head Timber (2) Coos Bay, Ore. — 12,332,622
379. Phillips Bros. Lumber (2) Brookhaven, Miss. — 12,330,000
380. Clermond Hamel Ltd. (1) Beauce, Que. — 12,222,000
381. Almond Bros. Lumber Co. (1) Coushatta, La. — 12,200,000
382. Pitt Timber Ltd. (1) Port Coquitlam, B.C. — 12,200,000
383. Chesterfield Lumber Co. Inc. (1) Darlington, S.C. — 12,095,487
384. Seaman Timber Co. Inc. (2) Montevallo, Ala. — 12,000,000
385. Big Creek Lumber Co. (1) Davenport, Calif. — 12,000,000
386. E. Sondheimer Co. (1) Sondheimer, La. — 12,000,000
387. Fred Netterville Lumber Co. (1) Woodville, Miss. — 12,000,000
388. Alan McIlvain Co. (1) Philadelphia, Pa. — 12,000,000
389. Newman Lumber Co. Inc (1) Woodsville, N.H. — 12,000,000
390. Bellerive Ka'N'Enda Forest Products (1) Mont-Laurier, Que. — 12,000,000
391. Spatsum Lumber Ltd. (1) Lytton, B.C. — 12,000,000
392. Precision Pine Co. (1) Lakeview, Ore. — 11,832,000
393. Wiergate Lumber Co. Inc. (1) Wiergate, Texas — 11,800,000
394. Sooke Forest Products Ltd. (1) New Westminster, B.C. — 11,800,000
395. Swift Lumber Co. (1) Atmore, Ala. — 11,706,000
396. East Perry Lumber Co. (1) Frohna, Mo. — 11,600,000
397. Metcalf Lumber Co. (1) Thomasville, Ga. — 11,500,000
398. Aiken Lumber Co. (1) Aiken, S.C. — 11,500,000
399. Jackson Sawmill Co. (1) Jackson, Ala. — 11,400,000
400. Cecil Hodges Lumber (1) Sandersville, Ga. — 11,346,392

EVERY EFFORT has been made to make the data presented in this edition of the Annual Lumber Review as accurate as possible. However, because of erratic production periods, shutdowns and other factors in 1981, some information may not be complete. We welcome any corrections or changes. Please notify us at: FOREST INDUSTRIES, 500 Howard St., San Francisco, Calif., 94105. Telephone (415) 397-1881. —Ed.